Vol. 1071 Number 4

OFFICIAL GAZETTE

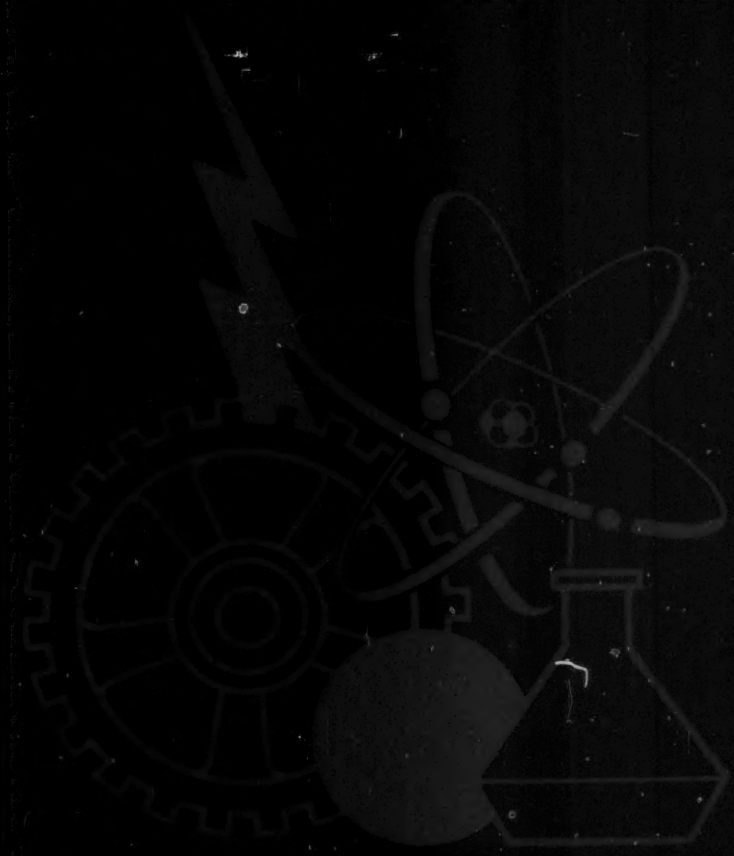
of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

PATENTS

October 28, 1986



U.S.
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OFFICIAL GAZETTE of the UNITED STATES PATENT AND TRADEMARK OFFICE

October 28, 1986 Volume 1071 Number 4

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The following are mailed under direction of the Superintendent of Documents, Government Printing Office, Washington, D.C., 20402, to whom all subscriptions should be made payable and all communications addressed:

THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
THE OFFICIAL GAZETTE (TRADEMARK SECTION), issued weekly.
GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

COPIES OF PATENTS are furnished by the Patent and Trademark Office at $1.50 each; PLANT PATENTS in color, $6.00 each; copies of TRADEMARKS at $1.00 each. Address orders to the Commissioner of Patents and Trademarks, Washington, D.C., 20231.

Printing authorized by Section 11(a)3 of Title 35, U.S. Code P.T.O.

PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1052 O.G. 52 on Mar. 26, 1985.

For use of the European Patent Office as Searching Authority for PCT applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

Certain domestic PCT fees for international applications have been changed effective Oct. 5, 1985 in the rule change notice titled "Revision of Patent Fees" published at 1057 O.G. 24 on Aug. 20, 1985.

The Search fee of the European Patent Office has been changed as of Feb. 9, 1986 and is announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

International PCT fees have been changed effective Jan. 1, 1986 and were announced in the *Official Gazette* at 1061 O.G. 30 on Dec. 31, 1985.

Note that the amount of the international search fee for the European Patent Office and the amounts of the International PCT fees will change effective June 1, 1986. For information on these fee changes see the notice appearing in the *Official Gazette* at 1065 O.G. 41 on Apr. 29, 1986.

The current schedule of PCT fees is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office as Searching Authority	
—No corresponding prior U.S. national application filed	420.00
—Corresponding prior U.S. national application filed	250.00
European Patent Office as Searching Authority	
if paid before Nov. 1, 1986	930.00
if paid on or after Nov. 1, 1986	1015.00
International fees	
Basic fee (first 30 pages):	
if paid before Nov. 1, 1986	375.00
if paid on or after Nov. 1, 1986	430.00
Basic Supplemental fee (for each page over 30):	
if paid before Nov. 1, 1986	7.00
if paid on or after Nov. 1, 1986	8.00
Designation fee for the first 10 national or regional offices:	
if paid before Nov. 1, 1986	90.00
if paid on or after Nov. 1, 1986	105.00
Designation fee for 11th and subsequent designations	No charge

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Patent Cooperation Treaty (PCT) Update

Change in International fees effective Nov. 1, 1986.

The International Bureau of the World Intellectual Property Organization has informed the U.S. Patent and Trademark Office that, due to changes in the exchange rate of the U.S. dollar with regard to the Swiss Franc and the German Mark, the dollar amount of the International Fees for PCT applications filed in the United States Receiving Office and for having an international search report prepared by the European Patent Office will increase effective Nov. 1, 1986.

Effective Nov. 1, 1986 the amount of the International Fees for PCT applications filed in the United States Receiving Office will be:

Basic Fee (first 30 pages)	$430.00
Basic Supplemental Fee (each page over 30)	8.00
Designation Fee (per country or region up to ten)	105.00
Designation Fee (for 11th and subsequent countries or regions)	No Charge

Effective Nov. 1, 1986 the amount of the search fee for an international application by the European Patent Office as an International Searching Authority will be $1015.

DONALD J. QUIGG,
Sept. 30, 1986. *Assistant Secretary and Commissioner of Patents and Trademarks.*

Board of Appeals Decisions Rendered in the Month of Sept. 1986

Affirmed	225
Affirmed in Part	38
Reversed	105
Total	368

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on applications filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Oct. 5, 1985. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the grant.

Attention is drawn to the patents which were issued on Oct. 25, 1983, for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,411,023 through 4,412,356
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months are set forth in 37 CFR 1.20(e) and (h), as amended effective Oct. 5, 1985, which are reproduced below:

37 CFR §1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982,

in force beyond 4 years; the fee is due by three years and six months after the original grant . . . . . $ 225.00"

"(h) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:
By a small entity (§1.9(f)) . . . . . $ 225.00
By other than a small entity . . . . . $ 450.00"

The amounts of the surcharges as amended effective Oct. 5, 1985, are set forth in 37 CFR 1.20 (k) and (l) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982 . . . . . $ 110.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:
By a small entity (§1.9(f)) . . . . . $ 55.00
By other than a small entity . . . . . $ 110.00"

Section 1.20 paragraph (m) as amended as a result of enactment of Public Law 98–622 effective Nov. 8, 1984, is reproduced below:

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay in payment is shown to the satisfaction of the Commissioner to have been unavoidable . . . . . $ 500.00"

Notice of Expiration of Patents Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED AUGUST 10, 1986 DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,343,059	06/251,643	8/10/82
4,343,084	06/254,536	8/10/82
4,343,104	06/285,796	8/10/82
4,343,108	06/215,784	8/10/82
4,343,139	06/252,221	8/10/82
4,343,220	06/253,789	8/10/82
4,343,266	06/218,216	8/10/82
4,343,290	06/238,507	8/10/82
4,343,306	06/236,834	8/10/82
4,343,321	06/228,901	8/10/82
4,343,399	06/254,004	8/10/82
4,343,410	06/218,839	8/10/82
4,343,412	06/251,151	8/10/82
4,343,471	06/275,603	8/10/82
4,343,478	06/243,395	8/10/82
4,343,539	06/240,048	8/10/82
4,343,557	06/225,271	8/10/82
4,343,617	06/243,871	8/10/82
4,343,618	06/291,999	8/10/82
4,343,621	06/240,317	8/10/82
4,343,662	06/249,321	8/10/82
4,343,664	06/251,635	8/10/82
4,343,676	06/248,035	8/10/82
4,343,696	06/231,115	8/10/82
4,343,701	06/253,029	8/10/82
4,343,742	06/225,150	8/10/82
4,343,796	06/272,727	8/10/82
4,343,822	06/245,636	8/10/82
4,343,938	06/304,757	8/10/82
4,344,013	06/286,827	8/10/82
4,344,047	06/233,751	8/10/82

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.19(a)).

4,376,261, Re. S.N. 709,519, Filed June 14, 1986, Cl. 318/254, TWO-PULSE BRUSHLESS D.C. MOTOR, Johann von der Heide, et al., Owner of Record: *Papst-Motoren GmbH & Co. KG., St. Georgen, Federal Republic of Germany,* Attorney or Agent: Theodore J. Koss, Jr., Ex. Gp.: 217

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b)).

No Publications This Issue.

Erratum

"All reference to Patent No. 4,614,539 to Meyer R. Rosen, et al., of N.Y. for 'PROCESS FOR AGGLOMERATING MINERALLL', appearing in the Official Gazette of Sept. 30, 1986, should be deleted since no patent was granted."

Status of PTO Services

The following is an update of the status of PTO services for October 1986:

Service Item	FY 1985 Goal (Calendar Days)*	FY 1986 Goal (Calendar Days)*	Monthly Average (Calendar Days)*
Filing Receipts:			
Patents	22	22	25
Trademarks	30	30	46**
Patent/Trademark Copies:			
Special Window Coupons	1	1	.5
Window Coupons	5	5	2
Mail Coupons	15	12	5
Letter Orders	24	16	12
Date of oldest unfilled order			Sept. 25, 1986
Current Mail Date being processed			Sept. 26, 1986
Certified Copies:			
Trademark Registrations	30	21	22
Applications-As-Filed	20	10	9
File-Wrapper/Contents	N/A	N/A	13
Walk-up Certification	1	1	2
Trademark Search Library:			
Filing Pending Marks	21	21	41**
Filing Reg. Certificates	3	Issue Date	2 days Late
Assignments:			
Patents	25	20	18
Trademarks	25	20	18
Avg. Days from Issue Fee Payment to Issue Date	90–100	90–100	107***
Issue Fee Receipts Mailed	4 weeks prior to Issue Date	4 weeks prior to Issue Date	On schedule
Patent Copies Available	Issue Date	Issue Date	99% on Issue Date
Trademark Copies Available	Issue Date	Issue Date	99% on Issue Date

* Unless otherwise noted.
** Tapes received late from contractor.
*** Interval from fee payment to issuance is increasing because of the budget cut which necessitated the printing of 4,000 fewer patents than originally planned in FY 86.

IMPROVEMENTS TO SERVICES

- *PTO Entering of Attorney Docket Number on Missing Part/Incomplete Notices* — In response to several requests from patent attorneys, the PTO is now entering the attorney docket number on the Notice of Incomplete Application and Notice to File Missing Parts of Application.

The attorney docket number which will be entered on the Notice will be that which was submitted on the transmittal letter as filed with a new patent application. The number must be clearly identified as an "attorney docket number". This number will be entered by the PTO under the Title of Invention on the Notices.

If the Office makes a mistake in recording the attorney docket number on the Notice of Incomplete Application or the Notice to File Missing Parts of Application, such mistake is not to be used by the attorney as cause for delay in response. Nor is the attorney to request that the Office correct the docket number prior to response to the Notice. The attorney can notify the Office in the response, but no change will be made by the Office until the Filing Receipt is issued.

If the attorney wishes to change the attorney docket number from that which was entered on transmittal letter as filed, the request must be submitted through amendment, submitted to the Patent Examining Corp.

QUALITY IMPROVEMENT

- Significant progress has been made in improving the quality of Patent Filing Receipts, Notices of Incomplete and Informal Patent Applications, and Notices of Recordation and Non-Recordation of Assignments.

In Feb., when we first began a special Quality Improvement Program, 26% of these documents were being issued with some type of error on them. Extra resources were being required to make the necessary corrections and reissue notices. As of the end of Sept., the error rate has been reduced to 15%, with more improvement expected over the next several months. At the same time, the cost or processing has been reduced.

In addition to making improvements to quality, the days to issue filing receipts was reduced by an average of four days during Sept.

Oct. 6, 1986.

THERESA A. BRELSFORD,
Assistant Commissioner
for Administration.

PATENT NOTICES

Certificates of Correction for the Week of Oct. 28, 1986

B1. 4,369,563	4,564,798	4,587,888	4,599,195
PP. 5,502	4,565,737	4,588,692	4,599,418
D. 283,901	4,566,074	4,589,159	4,600,227
D. 284,094	4,567,028	4,589,975	4,600,347
4,274,600	4,567,154	4,589,984	4,600,609
4,314,833	4,567,237	4,590,122	4,600,682
4,370,443	4,567,327	4,590,680	4,600,685
4,460,558	4,567,392	4,591,872	4,600,761
4,476,869	4,568,168	4,592,947	4,601,415
4,496,691	4,570,728	4,593,033	4,601,442
4,496,934	4,571,372	4,593,260	4,601,724
4,498,776	4,571,511	4,593,265	4,602,220
4,505,123	4,572,165	4,593,507	4,602,330
4,509,726	4,572,808	4,593,571	4,602,370
4,528,281	4,573,120	4,593,976	4,602,633
4,529,101	4,573,246	4,594,021	4,603,517
4,531,526	4,573,308	4,594,022	4,603,658
4,533,278	4,573,898	4,594,031	4,603,719
4,534,749	4,574,373	4,594,223	4,603,746
4,534,963	4,575,449	4,594,809	4,603,789
4,536,513	4,575,539	4,594,839	4,603,866
4,536,747	4,575,781	4,595,108	4,604,167
4,537,618	4,576,273	4,595,228	4,604,412
4,537,769	4,576,274	4,595,307	4,604,484
4,541,427	4,576,596	4,595,628	4,604,687
4,541,752	4,576,879	4,595,793	4,604,728
4,542,156	4,576,949	4,596,089	4,604,729
4,545,137	4,577,579	4,596,097	4,604,787
4,548,938	4,577,666	4,596,299	4,604,788
4,549,074	4,578,414	4,596,705	4,605,092
4,549,168	4,579,437	4,596,842	4,605,123
4,549,872	4,580,073	4,597,047	4,605,420
4,550,120	4,580,161	4,597,542	4,605,460
4,552,971	4,580,909	4,597,741	4,605,494
4,553,173	4,580,951	4,597,770	4,605,775
4,553,942	4,581,404	4,597,795	4,605,980
4,555,376	4,582,390	4,597,804	4,606,334
4,556,901	4,582,409	4,597,958	4,606,528
4,557,867	4,583,780	4,597,963	4,606,549
4,559,464	4,584,283	4,598,074	4,606,842
4,559,528	4,584,556	4,598,133	4,607,129
4,560,999	4,585,848	4,598,180	4,607,154
4,561,178	4,586,192	4,598,254	4,607,348
4,563,300	4,587,237	4,598,353	4,607,436
4,563,375	4,587,408	4,598,366	4,607,851
4,563,420	4,587,538	4,598,463	4,608,187
4,563,576	4,587,689	4,598,777	4,608,343
4,564,705	4,587,849	4,598,963	4,610,532

Reference Collections of U.S. Patents Available for Public Use in Patent Depository Libraries

The following libraries, designated as Patent Depository Libraries, receive current issues of U.S. Patents and maintain collections of earlier issued patents. The scope of these collections varies from library to library, ranging from patents of only recent years to all or most of the patents issued since 1790.

These patent collections are open to public use and each of the Patent Depository Libraries, in addition, offers the publications of the U.S. Patent Classification System (e.g. The Manual of Classification, Index to the U.S. Patent Classification, Classification Definitions, etc.) and provides technical staff assistance in their use to aid the public in gaining effective access to information contained in patents. With one exception, as noted in the table following, the collections are organized in patent number sequence.

Facilities for making paper copies from either microfilm in reader-printers or from the bound volumes in paper-to-paper copies are generally provided for a fee.

Owing to variations in the scope of patent collections among the Patent Depository Libraries and in their hours of service to the public, anyone contemplating use of the patents at a particular library is advised to contact that library, in advance, about its collection and hours, so as to avert possible inconvenience.

State	*Name of Library*	*Telephone Contact*
Alabama	Auburn University Libraries	(205) 826-4500 Ext.21
	Birmingham Public Library	(205) 226-3680
Alaska	Anchorage Municipal Libraries	(907) 264-4481
Arizona	Tempe: Noble Library, Arizona State University	(602) 965-7609
Arkansas	Little Rock: Arkansas State Library	(501) 371-2090
California	Irvine: University of California, Irvine Library	(714) 856-7234
	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale: Patent Information Clearinghouse*	(408) 730-7290
Colorado	Denver Public Library	(303) 571-2122
Connecticut	New Haven: Science Park Library	(203) 786-5000
Delaware	Newark: University of Delaware Library	(302) 451-2965
Florida	Fort Lauderdale: Broward County Main Library	(305) 357-7444
	Miami–Dade Public Library	(305) 375-2665
Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
Idaho	Moscow: University of Idaho Library	(208) 885-6235
Illinois	Chicago Public Library	(312) 269-2865
	Springfield: Illinois State Library	(217) 782-5430
Indiana	Indianapolis–Marion County Public Library	(317) 269-1741
Louisiana	Baton Rouge: Troy H. Middleton Library, Louisiana State University	(504) 388-2570
Maryland	College Park: Engineering and Physical Sciences Library, University of Maryland	(301) 454-3037
Massachusetts	Amherst: Physical Sciences Library, University of Massachusetts	(413) 545-1370
	Boston Public Library	(617) 536-5400 Ext. 265
Michigan	Ann Arbor: Engineering Transportation Library, University of Michigan	(313) 764-7494
	Detroit Public Library	(313) 833-1450
Minnesota	Minneapolis Public Library & Information Center	(612) 372-6570
Missouri	Kansas City: Linda Hall Library	(816) 363-4600
	St. Louis Public Library	(314) 241-2288 Ext. 390
Montana	Butte: Montana College of Mineral Science and Technology Library	(406) 496-4284
Nebraska	Lincoln: University of Nebraska-Lincoln, Engineering Library	(402) 472-3411
Nevada	Reno: University of Nevada Library	(702) 784-6579
New Hampshire	Durham: University of New Hampshire Library	(603) 862-1777
New Jersey	Newark Public Library	(201) 733-7815
New Mexico	Albuquerque: University of New Mexico Library	(505) 277-5441
New York	Albany: New York State Library	(518) 474-7040
	Buffalo and Erie County Public Library	(716) 856-7525 Ext. 267
	New York Public Library (The Research Libraries)	(212) 714-8529
North Carolina	Raleigh: D. H. Hill Library, N.C. State University	(919) 737-3280
Ohio	Cincinnati & Hamilton County, Public Library of	(513) 369-6936
	Cleveland Public Library	(216) 623-2870
	Columbus: Ohio State University Libraries	(614) 422-6286
	Toledo/Lucas County Public Library	(419) 255-7055 Ext. 212
Oklahoma	Stillwater: Oklahoma State University Library	(405) 624-6546
Oregon	Salem: Oregon State Library	(503) 378-4239
Pennsylvania	Philadelphia: Franklin Institute Library	(215) 448-1227
	The Free Library	(215) 686-5330
	Pittsburgh: Carnegie Library of Pittsburgh	(412) 622-3138
	University Park: Pattee Library, Pennsylvania State University	(814) 865-4861
Rhode Island	Providence Public Library	(401) 521-8726
South Carolina	Charleston: Medical University of South Carolina Library	(803) 792-2371
Tennessee	Memphis & Shelby County Public Library and Information Center	(901) 725-8876
	Nashville: Vanderbilt University Library	(615) 322-2775
Texas	Austin: McKinney Engineering Library, University of Texas.	(512) 471-1610
	College Station: Sterling C. Evans Library, Texas A & M University	(409) 845-2551
	Dallas Public Library	(214) 749-4176
	Houston: The Fondren Library, Rice University	(713) 527-8101 Ext. 2587
Utah	Salt Lake City: Marriott Library, University of Utah	(801) 581-8394
Virginia	Richmond: Virginia Commonwealth University Library	(804) 257-1104
Washington	Seattle: Engineering Library, University of Washington	(206) 543-0740
Wisconsin	Madison: Kurt F. Wendt Engineering Library, University of Wisconsin	(608) 262-6845
	Milwaukee Public Library	(414) 278-3247

All of the above-listed libraries offer CASSIS (Classification And Search Support Information System), which provides direct, on-line access to Patent and Trademark Office data.

*Collection organized by subject matter.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner

JAMES E. DENNY, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF September 13, 1986

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director	5-21-85
ORGANIC CHEMISTRY AND BIOTECHNOLOGY, GROUP 120—C. E. VAN HORN, Director	2-24-84
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 130—R. F. WHITE, Director	4-01-85
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	3-08-85
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—G. GOLDBERG, Director	10-09-84
SPECIAL LAWS ADMINISTRATION, GROUP 220—K. L. CAGE, Director	4-11-84
INFORMATION PROCESSING, STORAGE, AND RETRIEVAL, GROUP 230—E. LEVY, Director	11-21-83
PACKAGES, CLEANING, TEXTILES, AND GEOMETRICAL INSTRUMENTS, GROUP 240—TRYGVE M. BLIX, Director	4-25-85
ELECTRONIC AND OPTICAL SYSTEMS AND DEVICES, GROUP 250—EDWARD E. KUBASIEWICZ, Director	11-09-83
COMMUNICATIONS, MEASURING, TESTING AND LAMP/DISCHARGE GROUP, GROUP 260—S. G. KUNIN, Director	7-17-84
DESIGN, GROUP 290—K. L. CAGE, Director	4-02-84
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—B. R. GRAY, Director	2-19-85
MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—S. N. ZAHARNA, Director	12-24-84
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—R. E. AEGERTER, Director	5-21-84
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—D. J. STOCKING, Director	2-25-85
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350—A. L. SMITH, Director	3-03-86

Expiration of patents: The patents within the range of numbers indicated below expire during September 1986, except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents ..... Numbers 3,464,063 to 3,470,563, inclusive

Plant Patents ..... Numbers 2,918 to 2,926 inclusive

REISSUES

OCTOBER 28, 1986

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

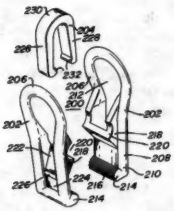
Re. 32,269
PLASTIC CLIP

Leonard Bisk, Elkins Park, and Gunther Rogahn, Lansdale, both of Pa., assignors to Independent Products Company, Inc., West Point, Pa.

Original No. 4,335,838, dated Jun. 22, 1982, Ser. No. 137,930, Apr. 7, 1980. Application for reissue Mar. 8, 1984, Ser. No. 587,343

Int. Cl.[4] A47J *51/095, 51/14;* **D06F** *55/02*

U.S. Cl. 223—91 **8 Claims**



7. A clip arranged for ready assembly on a rod-like element of a first predetermined diameter, said clip comprising a pair of jaws formed of a first plastic material and resilient bias means formed of a second plastic material having a higher tensile strength and greater resiliency than said first plastic material, each of said jaws including a generally planar member comprising a first end portion, an intermediate portion, and a second end portion including a projection extending at an angle to the plane of said planar member, said intermediate portion having an outer inclined surface, and said first end portions being movable relative to each other by a user for moving said second end portions relative to each other from a normally closed position to an opened position, said resilient bias means, in an unbiased state thereof, being a generally U-shaped member having a pair of outwardly flared legs each terminating in a free end and an arcuate intermediate portion defining a recess having a first predetermined diameter, the free ends of said bias means being spaced apart by a distance greater than the diameter of said recess, said spaced-apart distance permitting the free ends of the bias means in said unbiased state to engage the inclined outer surfaces of the intermediate portions of the jaws to enable said bias means to be readily manually secured in a biased state to said jaws by sliding said legs along said inclined surfaces into said biased state, each of said legs overlying and engaging a respective one of said jaws adjacent said intermediate portion for holding said jaws together and biasing said second end portions into said normally closed position, said intermediate portion of each of the jaws also including an arcuate recess therein for closely receiving a portion of the periphery of said rod-like element when said resilient bias means is assembled with said jaws, the recess defined by the arcuate intermediate portion of said bias means coacting with the recesses in the intermediate portions of the jaws to form an arcuate opening closely receiving a portion of said rod-like element therein, said first end portions and said second end portions of said jaws being movable relative to each other on an outer peripheral surface of said rod-like element.

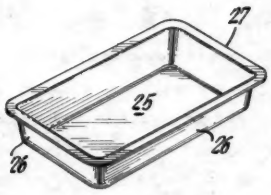
Re. 32,270
POLYESTER COATED PAPERBOARD FOR FORMING FOOD CONTAINERS AND PROCESS FOR PRODUCING THE SAME

Lee J. Murray, Jr., Appleton, Wis., assignor to James River-Norwalk, Inc., Norwalk, Conn.

Original No. 4,147,836, dated Apr. 3, 1979, Ser. No. 891,053, Mar. 28, 1978. Continuation of Ser. No. 243,359, Mar. 13, 1981, abandoned, which is a continuation of Ser. No. 104,554, Jan. 8, 1980, abandoned. Application for reissue Jan. 27, 1984, Ser. No. 574,668

Int. Cl. B32B *27/10;* **B29C** *19/04;* **B05D** *3/06*

U.S. Cl. 428—335 **5 Claims**



13. A process for producing coated paperboard material suitable for forming pressed heatable food trays, comprising the steps of:

(a) passing a web of paperboard material through a corona discharge device at a corona energy density level sufficient to subject the paperboard to an energy density of at least 0.35 joules per square inch of paperboard surface;

(b) passing the corona treated paperboard into a nip formed between a chill roll and a backup roll while simultaneously passing a hot melt extrusion of polyethylene terephthalate into the nip between the corona treated side of the paperboard and the chill roll to produce a thickness of the extrusion coating on the paperboard of between 0.5 mil and 1.5 mils, the hot melt extrusion exiting from the extrusion die at an initial temperature of between 580° F. and 640° F. through an air gap before insertion into the nip, the air gap distance being selected with respect to the speed of the paperboard and the ambient and chill roll temperatures such that the temperature of the extrusion at the time of contact with said paperboard is above its melting temperature of about 480° F. and such that it is chilled below its glass transition temperature of about 179° F. at the time that it leaves the chill roll to thereby facilitate separation therefrom, said paperboard being selected such that the corona treated surface has a surface roughness, as determined by the Bendtsen test at 5 Kg. of at least 100, and a level of impurities, as detected by an iodine stain test (ΔL) on a Macbeth MS-2000 Spectrophotometer relative to a white plate standard, of less than 25.

17. A coated paperboard product made in accordance with the process of claims 13, 14, 15 or 16.

Re. 32,271

ISOLATION OF PLASMINOGEN ACTIVATORS USEFUL AS THERAPEUTIC AND DIAGNOSTIC AGENTS

Syed S. Husain, 139 Upland Ave., Newton, Mass. 02161; Boguslaw Lipinski, 97 Beaumont Ave., Newtonville, Mass. 02160, and Victor Gurewich, 11 Reservoir St., Cambridge, Mass. 02161

Original No. 4,381,346, dated Apr. 26, 1983, Ser. No. 182,976, Sep. 2, 1980. Continuation-in-part of Ser. No. 93,246, Nov. 13, 1979, abandoned. Application for reissue Apr. 26, 1985, Ser. No. 727,807

Int. Cl.[4] C12N 9/72, 9/48

U.S. Cl. 435—215 11 Claims

1. The method of isolating a plasminogen activator from urine or culture medium, comprising

providing an adsorptive matrix having fibrin precipitated on its surface,

exposing a mother liquid based upon urine or culture medium and containing high fibrin-affinity plasminogen activator to the fibrin-containing matrix, whereby those plasminogen activator molecules which have high affinity therefor are bound to molecules of fibrin,

removing the remaining mother liquid, and

separating the plasminogen activator from the fibrin.

10. [A] *Urokinase* plasminogen activator isolated from [a biological source such as] urine or culture consisting essentially of urokinase (human) characterized as (a) having a molecular weight of about 56,000 Daltons *as determined by gel-filtration*, (b) [having a specific activity of less than 50,000 CTA units/mg when assayed on a fibrin plate, (c) having the appearance of a single chain structure corresponding to a molecular weight of 56,000 Daltons as evidenced by] *appearing as* a single protein band *corresponding to a molecular weight of about* 56,000 Daltons on 7.5 percent polyacrylamide gel when sodium dodecyl sulfate-gel electrophoresis is performed on unreduced urokinase, [d] (*c*) retaining [the] said appearance [of a single chain structure as evidenced by a single protein band on 7.5 percent polyacrylamide gel when sodium dodecyl sulfate-gel] *when said* electrophoresis is performed on urokinase which has been reduced by 0.1M dithiothreitol *thereby indicating its single chain structure* and [(e)] (*d*) displaying a high binding affinity for fibrin precipitated on diatomaceous earth.

Re. 32,272

NON-FOGGING COATING COMPOSITION AND A SHAPED ARTICLE COATED THEREWITH

Masaaki Funaki, Toyonaka; Noboru Ohtani; Motoaki Yoshida, both of Nishinomiya; Akira Fujioka, Osaka, and Kazuo Sakiyama, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited and Nippon Sheet Glass Co., Ltd., both of Osaka, Japan

Original No. 4,522,966, dated Jun. 11, 1985, Ser. No. 268,106, May 28, 1981. Application for reissue Dec. 16, 1985, Ser. No. 809,525

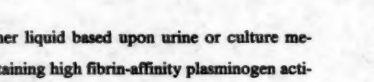
Claims priority, application Japan, May 29, 1980, 55-71747

Int. Cl.[4] C08K 5/54

U.S. Cl. 524—114 14 Claims

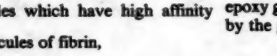
1. A non-fogging transparent coating composition free of organophosphate esters and amine aldehyde crosslinking agents, which comprises:

(A) 0 to 50 parts by weight



(calculated as $R_a^1-Si-O_{\frac{4-a-b}{2}}$)

of at least one compound selected from the group consisting of epoxy group-containing organic silane compounds represented by the general formula (1):



$$R_a^1-Si-(OR^3)_{4-a-b} \quad (1)$$

wherein R^1 stands for an organic group having an epoxy group, R^2 for a hydrogen atom, a hydrocarbon group having 1 to 6 carbon atoms or a vinyl group, R^3 for a hydrocarbon group having 1 to 5 carbon atoms, an alkoxyalkyl group or an acyl group having 1 to 4 carbon atoms, a for an integer having the value of 1 to 3 and b 0 or for an integer having the value of 1 to 2, providing that $a+b \leqq 3$ is satisfied, and partial hydrolyzates thereof,

(B) 20 to 80 parts by weight selected from triethylene glycol and a polyhydric alcohol which has an ethylene oxide chain and a molecular weight of 200 to 2000 and is capable of reacting with a component (C) as defined below or a mixture of the components (A) and (C) to form a coating film,

(C) 10 to 75 parts by weight of a polymer or copolymer containing at least 20% by weight of repeating structural units represented by the general formula (2):

(2)

wherein, R^4 and R^5 independently stand for a hydrogen atom, a lower alkyl group or a carboxyl group and X stands for a side chain possessing an epoxy group, and

(D) a catalytic amount of a perchlorate curing catalyst, providing that the total of the amounts of the aforementioned components (A), (B) and (C) is 100 parts by weight.

PLANT PATENTS

GRANTED OCTOBER 28, 1986

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

5,794

LOTUS PLANT CV CHARLES THOMAS

Perry D. Slocum, 191 Leatherman Gap Rd., Franklin, N.C. 28734

Filed Oct. 18, 1985, Ser. No. 789,131

Int. Cl.[4] A01H *5/00*

U.S. Cl. Plt.—68 1 Claim

1. A new and distinct variety of lotus plant substantially as herein shown and described.

PATENTS

GRANTED OCT. 28, 1986

ERRATA

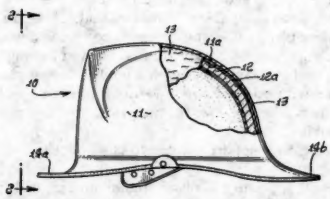
For CLASS	See PATENT NO.
623–023	4,619,569
423–220	4,619,608
266–088	4,619,693
420–417	4,619,696
560–122	4,619,782
540–361	4,619,783
540–593	4,619,784
540–318	4,619,785
540–310	4,619,786
540–200	4,619,787

PATENTS

GRANTED OCTOBER 28, 1986

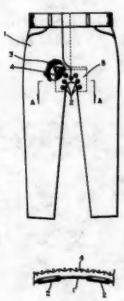
GENERAL AND MECHANICAL

4,619,003
INSULATED HELMET
Robert L. Asbury, Mill Valley, Calif., assignor to Bell Helmets Inc., Norwalk, Calif.
Filed Nov. 25, 1985, Ser. No. 801,329
Int. Cl.[4] A42B *1/06, 3/00*
U.S. Cl. 2—5 **10 Claims**



1. In a heat resistant helmet composite, the combination comprising
(a) an outer dome-shaped shell,
(b) an inner liner received in the shell, the liner having an outer dome shaped surface to fit in the shell, and
(c) a metal foil sheet extending between the shell and the liner and extending over and adjacent the dome-shaped surface of the liner,
(d) the liner consisting of foamed plastic material, and being substantially thicker than the shell, the foil sheet loosely adherent to said liner outer surface.

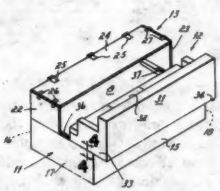
4,619,004
PANTS WITH AIR VENTILATION PANEL
In H. Won, Seoul, Rep. of Korea, assignor to Choon Woo Lee, Seoul, Rep. of Korea
Filed May 6, 1985, Ser. No. 730,636
Claims priority, application Rep. of Korea, May 16, 1984, 84-4505[U]; Oct. 17, 1984, 84-10177[U]
Int. Cl.[4] A41D *1/06*
U.S. Cl. 2—227 **3 Claims**



1. Pants with an air ventilation panel comprising:
a plurality of perforated eyelets riveted to said panel and providing ventilation openings therein;
a net fabric sewn to the back surface of said panel along the edge thereof, a portion of said edge of said net fabric being left unsewn;
a zipper one stringer secured to said ventilation panel and the other stringer secured to said unsewn edge for opening and closing said net fabric whereby an openable and closable pocket is formed therebetween.

2. Pants with an air ventilation panel comprising:
an air ventilating net woven fabric sewn to a crotch area of said pants;
a net fabric sewn to the back surface of said panel along the edges thereof, a portion of the edge of said second net fabric being left unsewn; and
mating separable fastening means on the inside of said panel, a first part of said separable fastening means being secured to the back surface of said first net fabric and a second part of said mating separable fastening means being secured to the unsewn edge of said second net fabric whereby an openable and closable pocket is formed therebetween.

4,619,005
WATERBED, SOFA AND TABLE
Imants R. Rutens, 8853 Valley Circle Dr., Florence, Ky. 41042
Filed Apr. 24, 1985, Ser. No. 726,427
Int. Cl.[4] A47C *27/08*
U.S. Cl. 5—2 R **12 Claims**

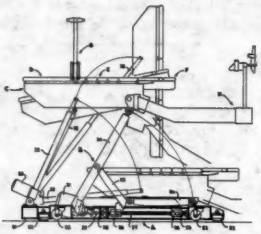


1. A modular furniture system comprising:
a waterbed having a frame including elongated side and end members defining a bed area, and a flexible bladder means for containing water within said bed area surrounded by said frame;
a sofa mounted on said waterbed frame;
said sofa comprising a seat member and back member fixed to each other in an attitude permitting sitting thereon;
mounting element means for removably mounting said sofa over said waterbed frame;
said seat and back members remaining in said fixed attitude when said sofa is removed from over said frame;
said sofa extending longitudinally along and over one of said elongated side members and portions of each of said elongated end members, such that a portion of the bed area surrounded by said frame is covered by said sofa and another portion of said bed area is uncovered by said sofa; and
a table means disposed rearwardly of said sofa and for removably covering said other portion of said bed area.

4,619,006
BED FOR PASSIVE, AUTOPASSIVE OR AGAINST PATIENT RESISTANCE MOTOR RE-EDUCATION, SUPPLIED WITH MECHANICALLY CONTROLLED AND BY ELECTRONIC OPERATED, PROGRAMMABLE AND CONTROLLABLE COMPONENTS
Pierangelo Magnoni; Pier E. Strada, both of Milan; Walter Cavagnis, Merate, and Angelo Sanvito, Milan, all of Italy, assignors to O.F.M.E.C. Officine Meccaniche Mantovane S.p.A., Mantova, Italy
Filed Feb. 27, 1985, Ser. No. 706,325
Claims priority, application Italy, Feb. 28, 1984, 19825 A/84
Int. Cl.[4] A61G *7/06*
U.S. Cl. 5—68 **7 Claims**

1. A bed particularly constructed for the motor re-education of a patient, said bed comprising a base, an elongated support

frame, first support lever means extending between said base and said support frame for raising and lowering said support frame relative to said base and selectively tilting said support frame about an axis transversely of the length of said support frame, a head rest, means mounting said head rest for pivotal movement about a transverse axis on said support frame, second support lever means extending between said support frame and said head rest for selectively tilting said head rest relative to said support frame, back rest cushion means on said support frame defining a back zone, leg supports pivotally carried by said support frame for vertical movement relative to said support frame, arm supports carried by said support frame, and a control unit for effecting movement and positioning of each of said first support lever means, said second support lever means



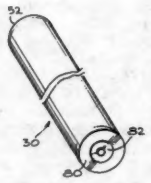
and said leg supports, each of said control units including a motor unit for effecting movement, a speedometer dynamo coupled to each motor unit for controlling the speed of operation of each of said motor units, an angle detector for detecting the angular position effected by the respective motor unit, together with a torque detector for each of said motor units and a control device for receiving and sending signals to said motor units for selecting the speeds of operation of said motor units and angular positions to which said support frame, said head rest and said leg supports are moved to allow a patient to execute a complete range of selected single, simultaneous and variously alternative exercises relating to flexural-extension movement of a patient's backbone, said control device including a microprocessor for programming the separate actuation of each of said motors in accordance with a selected exercise.

4,619,007

CELLULAR WATERBED COMPONENT AND METHOD OF MANUFACTURE

Angel M. Echevarria, 5416 La Crescenta Ave., and Michael A. Echevarria, 3550 Altura Ave., both of La Crescenta, Calif. 91214

Filed Sep. 29, 1982, Ser. No. 426,956
Int. Cl.[4] A47C *27/08*; B65B *7/00*
U.S. Cl. 5—451 **3 Claims**



1. A closed liquid container for use with a plurality of like containers in a waterbed, the container being fabricated from elongate pliable tubing of which each end comprises a continuous perimeter end portion, wherein the fabricated container has a fill opening of substantially lesser transverse dimension than the cross-sectional dimension of the tubing, the only opening in said tubing, between its opposite ends being said fill opening, said container being fabricated by a process comprising the steps of:

forcing a first end of said tubing around a closed perimeter support member, said support member having a backing surface conforming to a radially inwardly folded end portion of said tubing, said support member being capable of being dismantled into a configuration which can pass through said fill opening, the tubing end turning radially inward and folding against said backing surface;

placing said support member on a base for supporting said support member through said tubing;

placing a first end piece in position overlapping said radially inwardly folded end portion, said first end piece consisting of a material compatible to that of said tubing, said first end piece being sufficiently large to cover the open end of the tubing, thereby forming a first layered assembly;

bonding said first layered assembly while said end piece is in contact with said radially inwardly folded end portion so as to form a lap weld seal between said first end piece and said tubing;

transferring said support member to said opposite end of said tubing;

forcing said opposite end of said tubing around said support member such that the opposite end portion turns radially inward and folds against the backing surface of said support member;

placing said support member on a base for supporting said support member through said tubing;

placing a second end piece in position overlapping said radially inwardly folded end portion, said second end piece consisting of a material compatible to that of said tubing, said second end piece being sufficiently large to cover the open end of the tubing, thereby forming a second layered assembly;

bonding said second layered assembly while said end piece is in contact with said radially inwardly folded end portion so as to form a lap weld seal between said second end piece and said tubing;

dismantling said support member; and

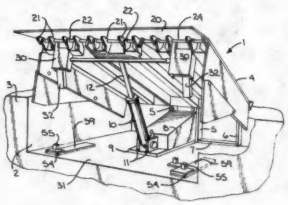
removing said dismantled support member through the fill opening in the thus-fabricated closed liquid container.

4,619,008

DOCKBOARD CONSTRUCTION

Jonathan W. Kovach, Milwaukee, and Martin P. Hageman, Mequon, both of Wis., assignors to Kelley Company, Inc., Milwaukee, Wis.

Filed Jul. 30, 1984, Ser. No. 635,840
Int. Cl.[4] E01D *1/00*
U.S. Cl. 14—71.7 **16 Claims**



1. In a dockboard to be mounted in a pit in a loading dock, a supporting structure, a ramp hinged to said supporting structure and movable from a horizontal cross traffic position to an upwardly inclined position and to a downwardly inclined below dock level position, means for pivoting the ramp between said positions, at least one cross traffic leg pivoted to the forward portion of the ramp and extending downwardly from the ramp and movable between an upright supporting position and a rearwardly pivoted retracted position, said cross traffic

leg when in said supporting position disposed to engage the bottom of the pit to support the ramp in said horizontal cross traffic position, locking means engageable with the cross traffic leg to prevent the cross traffic leg from pivoting from the supporting position to the retracted position when the ramp is in the cross traffic position, first biasing means interconnecting said ramp and said leg, said first biasing means being movable between a loaded condition wherein said first biasing means exerts a force on said leg to urge said leg to said retracted position and a relaxed condition, manual means for moving said first biasing means from the relaxed condition to the loaded condition, means responsive to elevation of the ramp to a predetermined position above the cross traffic position for releasing said locking means to enable said first biasing means to pivot the cross traffic leg to the retracted position whereby the ramp can then be lowered to the downwardly inclined position, and means responsive to the ramp moving to a downwardly inclined position for moving said first biasing means from the loaded condition to the relaxed condition.

4,619,009

TOOTH CLEANING APPARATUS

Otto Rosenstatter, Seeham, Austria, assignor to Durr-Dental GmbH & Co. KG, Bietigheim, Fed. Rep. of Germany

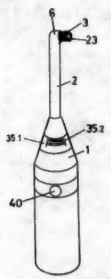
PCT No. PCT/EP83/00347, § 371 Date Aug. 23, 1984, § 102(e) Date Aug. 23, 1984, PCT Pub. No. WO84/02453, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 23, 1983, Ser. No. 644,730

Claims priority, application Austria, Dec. 24, 1982, 4683/82; Jul. 28, 1983, 2752/83

Int. Cl.[4] A46B *13/04*

U.S. Cl. 15—29 **13 Claims**



1. Tooth cleaning apparatus comprising

a drive and grip part comprising a symmetrical cylindrical casing and a motor housed in said casing, and,

a brush part removably attached to said drive and grip part comprising a hollow elongate shank portion extending from an end of said casing and having at its outer end a transverse bearing for a rotatable brush, a brush rotatable in said bearing and a drive shaft having at an inner end driving connections with said motor and at an outer end driving connections with said rotatable brush,

said elongate shank portion and drive shaft being coaxial with said cylindrical, said shank portion having an enlarged inner end portion coaxial with and adjoining said cylindrical casing, diametrically opposite hook portions provided on said enlarged inner end portion of said shank portion and engageable with locking webs formed on a deformable thin wall portion of said cylindrical casing, said thin wall portion of the casing being deformable by lateral pressure applied to selected regions to disengage said hook portions from said webs and thereby release said brush portion from said casing.

4,619,010

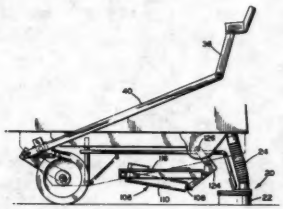
SCRUBBER WITH MECHANISM FOR AUTOMATICALLY RAISING AND LOWERING A SQUEEGEE ASSEMBLY

Jack L. Burgoon, Toledo, Ohio, assignor to Cooper Industries, Inc., Houston, Tex.

Continuation of Ser. No. 596,652, Apr. 4, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 783,047

Int. Cl.[4] A47L *11/30*

U.S. Cl. 15—50 R **14 Claims**



1. A walk-behind scrubber comprising:

a body;

wheels supporting said body above a floor;

a scrub brush at a forward portion of said body;

a squeegee assembly at a rear portion of said body;

mechanical means including electrically driven means for raising and lowering said squeegee assembly, said mechanical means including a follower arm connected to said squeegee assembly and pivotally connected to said body, a pivotable lift rack engageable with said follower arm when said squeegee assembly is raised, said pivotable lift rack being connected to said electrically driven means and having a roller extending transversely of said scrubber which engages said follower arm when said squeegee assembly is raised;

a switch connected with said electrically driven means having a first condition in which said mechanical means is moved to raise said squeegee assembly and a second condition in which said mechanical means is moved to lower said squeegee assembly;

handle means movably mounted on a rear portion of said body; and

means including link means connected to said handle means and engageable with said switch to cause said switch to be in its second condition when said handle means is manipulated to move said scrubber forwardly and to cause said switch to be in its first condition when said handle means is manipulated to move said scrubber rearwardly.

4,619,011

MECHANICAL CHIMNEY SWEEP

Ronald L. Grooms, 2280 W. Ustick Rd., P.O. Box 615, Meridian, Id. 83642

Filed Apr. 8, 1985, Ser. No. 721,271

Int. Cl.[4] F23J *3/00*

U.S. Cl. 15—163 **2 Claims**

1. Mechanical chimney sweep apparatus for chimneys of the type having a flue pipe or liner, said apparatus comprising:

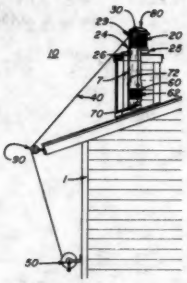
a spark arrester, tubular in shape, and provided with a multiplicity of openings in the side wall thereof, said arrester insertable into said flue pipe or liner, and said arrester provided with one or more brackets, substantially inverted L-shape in form, said brackets operable to engage the top lip and exterior surface of said flue pipe or liner;

a pulley supported by said arrester;

an externally mounted winch;

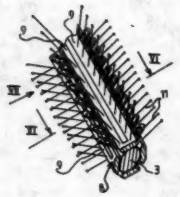
a cable attached to one end to said winch, engaging said pulley, and terminating at the other end within the enclosure defined by said arrester and said flue pipe or liner;

a brush for cleaning the walls of said pipe or liner, said brush affixed to the end of said cable; and



a counterweight attached to said cable and downwardly depending from said brush.

4,619,012
HAIRBRUSH
Jean-Louis Wachtel, Selestat, France, assignor to Celluloid S.A., France
Filed May 30, 1985, Ser. No. 739,327
Claims priority, application France, Feb. 27, 1985, 85 02860
Int. Cl.[4] A46B *9/00, 9/08*
U.S. Cl. 15—187 **13 Claims**



1. A hairbrush including a handle, a head extending in prolongation of said handle, and pins projecting from said head radially outwardly thereof for disentangling hair, wherein said head includes a core portion on which is fixed an elongate hollow body including a certain number of strips arranged circumferentially at substantially regular intervals and spaced from said core portion so as to facilitate the circulation of air for drying the hair, said pins being substantially arranged regularly along said strips, said hairbrush further comprising at least one plurality of small closed loops arranged at substantially regular intervals along said core portion and projecting between two adjacent strips by a height greater than the distance between the strips and the core portion so that two adjacent loops retain the end of a hair tuft during the brushing.

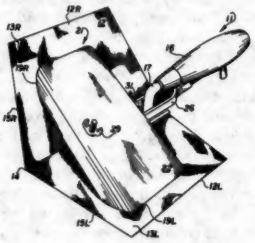
4,619,013
WALL CORNER FINISHING TOOL
Gary Yon, 8495 Remington Dr., Pittsburgh, Pa. 15237
Filed Aug. 23, 1985, Ser. No. 769,163
Int. Cl.[4] B05C *17/10*
U.S. Cl. 15—235.8 **5 Claims**

1. A wall board corner finishing tool comprising:

a. A body formed of a manually flexible, planar sheet material having two substantially flat sides juxtaposed and extending radially from one common axis to define a dihedral configuration set at a uniform angle from the edge thereof throughout its length, which angle is measureably greater than 90° but less than 120°;

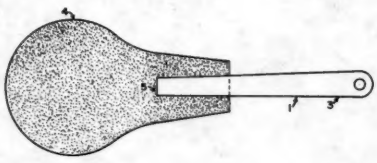
b. A gripping means affixed essentially centrally of the inner surfaces of the dihedral body and extending rearwardly of the back edge thereof; and

c. a tool angle biasing means extending beneath gripping means and pivotally connect therewith and connected to means for biasing outwardly the flat sides of the tool to



enlarge the set angle normally defined by said flat sides, so as to allow their divergence relative to each other when the sides are flexed outwardly during use, thereby to aid in smooth blending of the seam sealing materials into the wall board corner.

4,619,014
SCALP CLEANER
Stuart Piken, 351 E. 84th St., New York, N.Y. 10028
Filed Feb. 22, 1985, Ser. No. 704,511
Int. Cl.[4] A47K *7/04*
U.S. Cl. 15—244 R **1 Claim**



1. A scalp cleaning device capable of insertion between the scalp and a hairpiece secured to the scalp along the perimeter of a non-planar contoured area of the scalp over which the hairpiece is juxtaposed, the hairpiece being secured altitudinally closely adjacent the contoured area of the scalp such that only limited altitudinal space is available for insertion and cleaning manipulations of the scalp cleaning device between the hairpiece and the contoured area of the scalp, said scalp cleaning device comprising:

an elongate handle; and

a cleaning member, such as a sponge, affixed to the elongate handle to enable said cleaning manipulations of the cleaning member;

the elongate handle and the cleaning member being flexible and relatively thin in the altitudinal direction so as to enable flexible conformance of the scalp cleaning device to the non-planar contour of the contoured area during said cleaning manipulations with minimal force against the hairpiece, whereby said cleaning manipulations are facilitated within the confines of said limited altitudinal space;

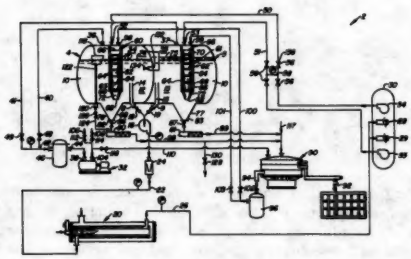
the cleaning member being located altitudinally beneath a portion of the elongate handle such that said portion of the handle is interposed between the hairpiece and the cleaning member during said manipulations.

4,619,015

VACUUM LOADING CLEANING SYSTEM

William G. Urbani, Stockton, Calif., assignor to Industrial Innovations, Inc., Stockton, Calif.

Filed Oct. 2, 1984, Ser. No. 657,284
The portion of the term of this patent subsequent to Aug. 21, 2001, has been disclaimed.
Int. Cl.[4] A47L 5/12; B08B 3/02, 3/10; B07C 5/00
U.S. Cl. 15—302 11 Claims



1. A surface cleaning system for use with a cleaning liquid comprising:

a substantially sealed pressure vessel having a liquid outlet, a vacuum outlet and a suction inlet in fluid communication with the interior of said vessel, said vacuum outlet and said suction inlet communicating with an upper region of said vessel and said liquid outlet communicating with a lower region of said vessel;

first pump means, fluidly connected to said liquid outlet, for pumping the cleaning liquid from said vessel through a first line, said liquid partially filling said pressure vessel so that said vacuum outlet is above the free surface of said cleaning liquid;

means, fluidly connected to said vacuum outlet, for drawing a partial vacuum within said upper region of said pressure vessel;

means fluidly connected to said first line for directing said cleaning liquid at a surface to be cleaned to dislodge contaminants from said surface;

a second line fluidly connected to said suction inlet at one end to provide a source of suction at the other end of said second line, said other end positioned at the surface to be cleaned so to suck cleaning liquid and dislodged contaminants from the surface and back to said vessel;

a booster pump mounted along said second line to aid movement of said cleaning liquid and dislodged contaminants along said second line;

solids separator means, including a solids separator inlet, for removing solids from a mixture of solids and liquids;

pipe means for fluidly connecting said solids separator inlet to said vessel, said pipe means adapted to pass a mixture of solids and said cleaning liquid from said vessel to said solids separator means; and

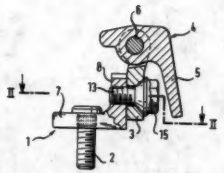
said solids separator means including a liquid outlet, fluidly coupled to the interior of said vessel, for drawing liquid from said solids separator means into said vessel.

4,619,016

HINGE ATTACHMENT ARRANGEMENT FOR AN ADJUSTABLE, DETACHABLE ATTACHMENT OF MOTOR VEHICLE DOORS

Ernst Brockhaus, Remscheid-Hasten, Fed. Rep. of Germany, assignor to ED. Scharwächter GmbH & Co. KG, Remscheid, Fed. Rep. of Germany

Continuation of Ser. No. 567,530, Jan. 3, 1984, abandoned. This application Oct. 2, 1985, Ser. No. 783,256
Claims priority, application Fed. Rep. of Germany, Jan. 3, 1983, 3300006
Int. Cl.[4] E05D 5/02
U.S. Cl. 16—383 7 Claims



1. Hinge attachment arrangement for motor vehicle doors comprising a wing-type hinge including a vertically arranged first hinge wing, a vertically arranged second hinge wing, and a vertical hinge pin interconnecting said first and second hinge wings, said first hinge is arranged to be connected to a door on a vehicle, a fastening element is arranged to be attached to the door frame of the vehicle, said second hinge wing is arranged to be detachably fastened to said fastening element so that the vehicle door can be removed after it is aligned on the door frame for completing outfitting of the vehicle and then remounted in the final assembly, means forming guide surfaces disposed at least in part on one of said second hinge wing and said fatening element so that said guide surfaces slide relative to one another when assembling said hinge attachment arrangement, said fastening element and second hinge wing each having bearing surfaces therein in slidable contact with one another when said second hinge is fastened to said fastening element, said guide surfaces extend transversely to said bearing surfaces, wherein the improvement comprises that said second hinge wing having a first hole extending therethrough transversely of said bearing surfaces, said fastening element having a second hole extending therethrough in general alignment with the first hole in said second hinge wing, at least one fastening bolt separate from said guide surfaces for attaching said second hinge wing to said fastening element and extending through the first hole in said second hinge wing and through the second hole in said fastening element, said second hole in said fastening element being threaded for receiving said fastening bolt in threaded engagement and said first hole in said second hinge bearing having a larger diameter than said second hole so that with said fastening bolt extending through said first hole into said second hole there is play between the surface of said fastening bolt and said first hole, said means forming guide surfaces are shaped at least in part for providing self-centering of said second hinge wing relative to said fastening element and for eliminating play between said second hinge wing and said fastening element, at least one axially extending attachment member having a longitudinal axis and being secured at one end to at least one of said second hinge wing and fastening element, said at least one axially extending attachment member having a part extending along the longitudinal axis with the axis of said attachment member extending transversely of said bearing surfaces, a recess extending along the longitudinal axis from the other end toward said one end and formed in the axially extending part of said attachment member extending through the other one of said second hinge wing and fastening element and said attachment member forming a part of said guide surfaces and said attachment member having an

axially extending conically shaped surface thereon that tapers toward the other end.

4,619,017

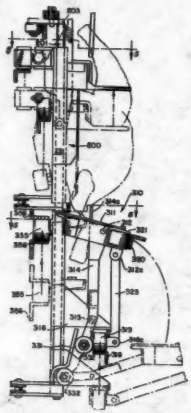
POULTRY PROCESSING APPARATUS

Lacy W. Simmons, 101 Simmons Industrial Blvd., Dallas, Ga. 30132

Division of Ser. No. 517,811, Jul. 27, 1983, Pat. No. 4,550,473, Continuation-in-part of Ser. No. 873,370, Jan. 30, 1978, abandoned. This application Aug. 1, 1985, Ser. No. 761,424

Int. Cl.[4] A22C *21/00*

U.S. Cl. 17—11 **5 Claims**



1. Apparatus for breaking the neck of a bird in a poultry processing operation, comprising:

(a) means for engaging the bird in such a manner so as to identify the locations of the bird's neck;

(b) V-shaped means for aligning and holding the bird's neck against displacement;

(c) means for engaging and breaking the neck of said bird; and

(d) means for supporting said engaging means, said aligning and holding means, and said breaking means on module support means which is advanced in timed relationship with said bird as said bird is advanced in a head lowermost position along a predetermined path in a processing line during a processing operation, the V-shaped aligning and holding means is pivotally coupled to the module support means so that it can pivot between a first open position and a second closed position in which the neck of the bird is properly aligned and held during the pivoting closing motion, and cooperates with the breaking means during the closing motion to break the neck of the bird.

4,619,018

APPARATUS FOR APPLYING A LENGTH OF FLEXIBLE TUBING TO THE FILLING PIPE OF A MULTIPLE-SPOUT HEAD

Herbert Niedecker, Am Ellerhang 6, 6240 Konigstein, Taunus, Fed. Rep. of Germany

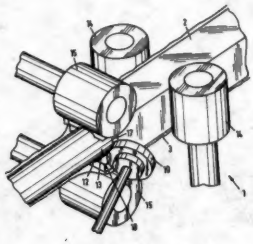
Filed Dec. 16, 1983, Ser. No. 562,491

Claims priority, application Fed. Rep. of Germany, Dec. 16, 1982, 3246639

Int. Cl.[4] A22C *11/12, 13/02*

U.S. Cl. 17—33 **3 Claims**

1. In an apparatus for applying a length of flexible tubing to the filling pipe of a multiple-spout head for making a casing section which is closed at one end and is to be processed further on a combined filling and closing machine, which apparatus also comprises a carrying element, which has a tubular end portion and is held by a tubing feeder for moving the tubing withdrawn from a roll of tubing and is axially moved into engagement with the end portion of the filling pipe to receive and at least partly cover the end portion of the filling pipe when the length of tubing is to be applied to the filling pipe, wherein gripping means for retaining the length of tubing on the carrying element and/or the filling pipe are provided, the improvement wherein the tubular end portion of the carrying element includes one or more notches, the apparatus further



including one or more gripping elements which are pivotally movable through said notches to retain the tubing on the end portion of the filling pipe when the carrying element has been axially moved into engagement with said end portion of the filling pipe, and feed rollers held against rotation to grip and retain the tubing on the tubular end portion of the carrying element, the center lines of said feed rollers being approximately disposed in the same plane as the gripping points at which the gripping elements engage the end portion of the filling pipe.

4,619,019

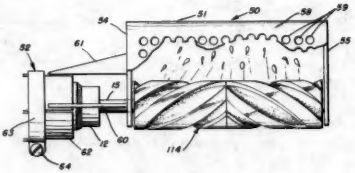
FISH SCALING DEVICE

Clifford D. Hardy, 6296 Ashton Rd., Memphis, Tenn. 38134

Filed Jun. 4, 1985, Ser. No. 740,981

Int. Cl.[4] A22C *25/02*

U.S. Cl. 17—67 **14 Claims**



1. A fish scaling tool adapted to be rotated by a portable rotary motor having tool drive means, said fish scaling tool comprising an elongated cylindrical body member having a longitudinal axis and an interrupted peripheral surface, a pair of flat opposite ends normal to said axis, a plurality of equally spaced parallel longitudinal blades extending generally radially along said body member between said ends, and a plurality of parallel longitudinal grooves formed in said body member between said ends and alternating with said blades, and a shank extending axially from one end of said body member for driven engagement with said tool drive means, each of said blades having a surface portion of substantial width coincident with the peripheral surface of said body member between grooves and a pair of smooth, continuous longitudinally extending edges on opposite sides of said blade where the grooves on opposite sides of said blade interrupt the peripheral surface of said body member, said grooves opening outwardly between adjacent blades and being of generally arcuate cross section and uniform depth between the longitudinal edges of adjacent

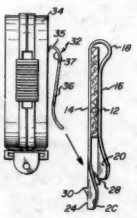
blades, a space between longitudinal edges of adjacent blades providing an opening to said grooves whereby scales being removed from a fish may freely enter and leave said grooves.

4,619,020

RULE CLIP HOLDER FOR BELT OR THE LIKE

Bernard G. Lecher, Sr., LaCrosse, Wis., assignor to The Stanley Works, New Britain, Conn.

Filed May 10, 1985, Ser. No. 732,681
Int. Cl.[4] A44B *21/00*; A45F *5/02*
U.S. Cl. 24—10 A **8 Claims**



1. A holder for supporting a measuring rule or like object, which object has a spring clip thereon with a resiliently deflectable tongue portion declining inwardly from an upper connecting portion, said holder comprising generally parallel inner and outer legs joined by an upper, resiliently deflectable connecting portion and adapted to engage the user's belt or similar supporting part inserted upwardly therebetween, said outer leg being sustantially longer than said inner leg and having a relatively wide and substantially planar lower portion with a laterally extending slot formed therethrough adjacent the lower edge thereof, said slot being dimensioned and configured for facile insertion of the tongue portion of the spring clip of the object to be supported, said lower portion having at least one terminal element thereon which extends inwardly a distance sufficient to hamper inadvertent disengagement of said holder from a belt inserted between said legs.

4,619,021

CLOSURE STRIP TO BE APPLIED TO BAGS

James R. Johnson, 3819 Greenhill Dr., Chamblee, Ga. 30341

Filed Jul. 23, 1984, Ser. No. 633,219
Int. Cl.[4] B65D *77/10*
U.S. Cl. 24—30.5 P **2 Claims**

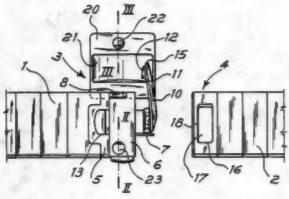
1. A bag formed of thermoplastic sheet material having a closure strip at the top of said bag for selectively closing said bag, said closure strip being formed of a substantially thicker material than said sheet material of said bag, said closure strip including a rear closure member for attachment to the back panel of said sheet material and a front closure member for attachment to the front panel of said sheet material, said rear closure member and said front closure member being interengageable with each other, said rear closure member including an upper mounting flange extending towards the top of said bag and a lower mounting flange extending towards the bottom of said bag, said front closure member including an upper mounting flange extending towards the top of said bag and a lower mounting flange extending towards the bottom of said bag, said lower mounting flange of said front closure member extending beyond said lower mounting flange of said rear closure member when said rear closure member and said front closure member are interengaged, said lower mounting flange of said front closure member defining a beveled edge for allowing said lower mounting flange to merge smoothly into said front panel of said sheet material so that said sheet material of said bag can flow smoothly into the material of said closure in spite of the differences in thickness of said sheet material of said bag and said closure, said lower mounting flange of said rear closure member defining a beveled edge for allowing said lower mounting flange to merge smoothly into said rear panel of said sheet material, and further characterized in that said beveled edge on said lower mounting flange of said front closure member begins beyond said lower mounting flange of said rear closure member, the arrangement being such that the plurality of layers comprising said rear panel of said sheet material, said lower mounting flange of said rear closure member, said lower mounting flange of said front closure member and said front panel of said sheet material all merge smoothly for allowing an imperforate weld of said thermoplastic material at said closure strip.

4,619,022

DOUBLE-SAFETY CATCH FOR A BRACELET

Fernando Fontana, Sesto Calende, Italy, assignor to Omega SA, Switzerland

Filed Mar. 12, 1985, Ser. No. 710,805
Claims priority, application Italy, Mar. 20, 1984, 20157 A/84
Int. Cl.[4] A44B *11/28*
U.S. Cl. 24—69 J **12 Claims**



1. A double-safety catch for connecting a first bracelet portion and a second bracelet portion, the catch having an assembly for attachment to the first bracelet portion and comprising: first and second closure elements, said first closure element being pivotally mounted in said assembly to pivot about an axis perpendicular to the longitudinal direction of the bracelet portions to trap an end member of the second bracelet portion and said second closure element being pivotally mounted in said assembly to pivot about a second axis extending in the longitudinal direction of the bracelet portions and thereby cover said first closure element.

4,619,023

SLIDE FASTENER

Yoshitoki Tsubokawa, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 15, 1985, Ser. No. 712,153
Claims priority, application Japan, Mar. 28, 1984, 59-45465[U]
Int. Cl.[4] A44B *19/40*
U.S. Cl. 24—394 **3 Claims**

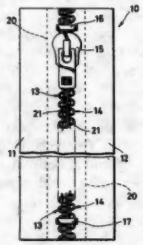
1. A slide fastener comprising:

(a) a pair of support tapes of uniform transverse cross-section each carrying on its one longitudinal edge a row of coupling elements, each said support tape having a series of perforations extending along said row of coupling elements and being made of one of a film of plastics material, a non-woven fabric and a thread-free web;

(b) a series of sewing stitches securing said row of coupling elements to each support tape, said sewing stitches comprising double locked stitches formed of a looper thread of

a multifilamentary material and a monofilamentary needle thread having a plurality of loops passing through corresponding ones of said performations in said support tape and interlaced with said looper thread, and

(c) each of said loops of said needle thread having two



adjacent thread portions received in one of said perforations and having a substantially thermally undeformable circular cross-section, each of said perforations having a substantially thermally undeformable oblong shape and conforming peripherally with said two adjacent portions of each said loop.

4,619,024

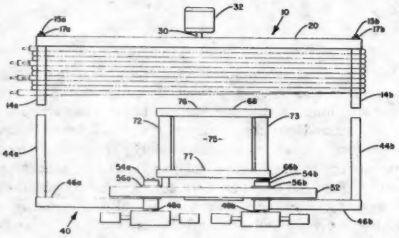
METHOD OF MAKING COILS

John R. McManus, Marcellus, and Lawrence W. Ubowski, Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,114

Int. Cl.[4] B21D *53/00;* **B23P** *15/26;* **F28F** *1/10*

U.S. Cl. 29—157.3 R **3 Claims**



1. A method of forming a slit fin heat exchanger comprising the steps of:

wrapping slit fin tubing about the pair of spaced parallel mandrels to form a flat coil having two spaced rows;

placing the flat coil in place on a pair of spaced parallel mandrels which are rotatable about spaced axes which are initially parallel to and in the same plane as the mandrels on which the coil is in place;

placing a piece of expanded metal between the two rows and rotating the mandrels on which the coil is placed in opposite directions, thereby, shifting the plane in which the coils and the mandrels are located;

initially contacting a planar surface of a platen with a portion of a first one of the rows of the coil;

shifting the second one of the rows of the coil into contact with the portion of the first one of the rows overlying the platen and the piece of expanded metal to cause nesting of the first and second rows of the coil and the piece of expanded metal;

folding the portions of the coil extending past the platen about curved portions of the platen and, thereby, extending the portions of the first and second rows which are nested; and

contacting an additional curved portion of the platen with the first one of the rows of the coil to form a knob at each end of the coil at the mandrels to extend the portions of the first and second rows which are nested to essentially the ends of the coil.

4,619,025

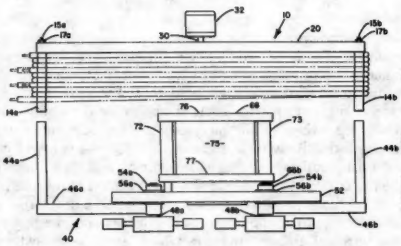
METHOD OF MAKING COILS

John R. McManus, Marcellus, and William E. Wright, East Syracuse, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Dec. 17, 1984, Ser. No. 682,449

Int. Cl.[4] B21D *53/00;* **B23P** *15/26;* **F28F** *1/10*

U.S. Cl. 29—157.3 R **3 Claims**



1. A method of forming a slit fin heat exchanger comprising the steps of:

placing an expanded metal cylinder on each of a pair of spaced parallel mandrels;

wrapping slit fin tubing about the pair of spaced parallel mandrels containing the expanded metal cylinders to form a flat coil having two spaced rows;

placing the flat coil in place on a pair of spaced parallel mandrels which are rotatable about spaced axes which are initially parallel to and in the same plane as the mandrels on which the coil is in place;

rotating the mandrels on which the coil is placed in opposite directions, thereby, shifting the plane in which the coils and the mandrels are located;

initially contacting a planar surface of a platen with a portion of a first one of the rows of the coil;

with the first one of the rows of the coil contacting the planar surface of the platen, shifting the second one of the rows of the coil into contact with the portion of the first one of the rows overlying the platen to cause nesting of the first and second rows of the coil;

folding the portions of the coil extending past the platen about curved portions of the platen and, thereby, extending the portions of the first and second rows which are nested; and

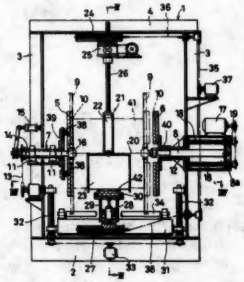
contacting an additional curved portion of the platen with the first one of the rows of the coil to form a knob at each end of the coil at the mandrels to extend the portions of the first and second rows which are nested to essentially the ends of the coil and further nesting the coil to the expanded metal cylinders.

4,619,026

APPARATUS FOR ASSEMBLING CABLE DRUM

Yoshiaki Suzuki, Yokohama, Japan, assignor to Toko Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 4, 1985, Ser. No. 783,994
Claims priority, application Japan, Aug. 31, 1985, 60-190966
Int. Cl.[4] B23K *37/04*
U.S. Cl. 29—256 3 Claims



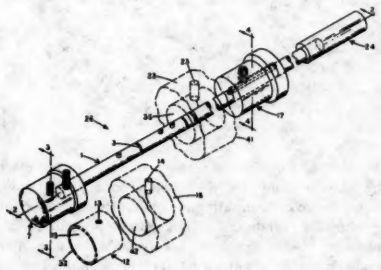
1. An apparatus for assembling a cable drum having a winding drum and flange plates with ribs mounted on the ends thereof, said apparatus comprising a pair of pressing plates, each pressing plate having mounting grooves for engaging the ribs on the flange plates, said pressing plates being positioned to face one another with the centers thereof aligned on a central axis, wherein said pressing plates are movable in the axial direction with respect to one another; and annular holder means for engaging the winding drum and positioning the winding drum such that the axis thereof is aligned with said center axis of said pressing plates, wherein said annular holder means includes at least two segment members, said segment members being movable with respect to one another.

4,619,027

TOOL FOR INSTALLING AND ALIGNING CAMSHAFT BUSHINGS IN INTERNAL COMBUSTION ENGINES

Michael J. Ohannesian, P.O. Box 51, Cotati, Calif. 94928

Filed Feb. 25, 1985, Ser. No. 704,706
Int. Cl.[4] B25B *27/14*
U.S. Cl. 29—275 12 Claims



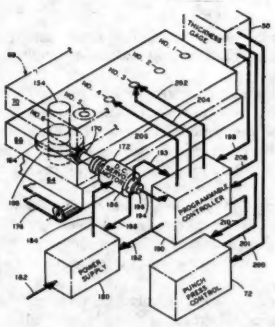
1. A tool for installing and aligning camshaft bushings in internal combustion engines such that the oil supply bore extending through the wall of each camshaft bushing is aligned with a corresponding oil delivery passage in the engine block, said tool comprising: a shaft, a working head removably attached to one end of said shaft for holding a camshaft bushing, said working head being insertable into the central passage of a cylindrical camshaft bushing and including positioning means for positioning and securing a camshaft bushing on said working head, said positioning means including spring-loaded engaging means for engaging the oil supply bore of the camshaft bushing to position and rotationally orient the camshaft bushing on said working head, guide means slidably mounted on said shaft, said guide means including a cylindrical part for closely fitting in a bushing receiving bore of an internal combustion engine, a positioning shoulder for limiting the penetration of said cylindrical part of said guide means into the bushing receiving bore, and spring-loaded engaging means on said guide means cylindrical part for engaging the oil delivery passage of the engine which extends through the engine block to the bushing receiving bore, said guide means being positioned for installation of a camshaft bushing when said cylindrical part extends into the bushing receiving bore up to said positioning shoulder and said spring-loaded engaging means engages the oil delivery passage, said guide means including a longitudinal cylindrical bore through which said shaft extends for slidable movement relative to said guide means, said longitudinal cylindrical bore including a key way extending through said guide means, and said shaft including a plurality of locator pins projecting outwardly from said shaft for entering said key way of said guide means whereby said shaft and said working head thereon are aligned with said guide means when a locator pin is in said key way, such that a camshaft bushing on said working head will be installed in alignment with said guide means when said shaft is struck at the end opposite said one end where said working head it attached.

4,619,028

APPARATUS FOR MANUFACTURE OF LAMINATED PARTS

Thomas R. Neuenschwander, Fort Wayne, Ind., assignor to L H Carbide Corporation, Fort Wayne, Ind.

Filed Mar. 25, 1983, Ser. No. 478,692
Int. Cl.[4] H02K *15/02*
U.S. Cl. 29—33 L 35 Claims



1. Apparatus for blanking from an elongated sheet stock strip material, provided from a supply, electric motor or generator part laminas of said material and stacking said laminas to form a completed stack comprising:

a blanking station;

a stacking station;

first means for guiding said material from the supply to said blanking station;

second means at said blanking station for blanking laminas in a predetermined planar configuration;

third means at said stacking station for receiving and stacking the laminas to form a stack having a central axis substantially perpendicular to he lamina plane;

fourth means coupled to said third means at said stacking station for providing rotation of stack about said axis

relative at least one of said laminas for compensating for thickness variations in said material;

said third means for interlocking said at least one lamina to an adjacent lamina in said stack after said rotation to retain the relative rotational position of said at least one lamina with said stack;

sixth means for gauging the thickness uniformity of said lamina strip material;

seventh means coupled to said sixth means for detecting a predetermined thickness nonuniformity of said material;

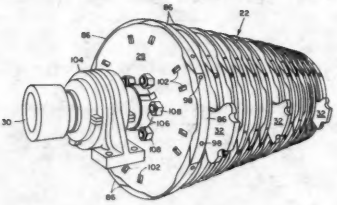
eighth means coupled to said fourth and seventh means and having operator entered inputs for actuating said fourth means to cause said relative rotation between said stack and said at least one lamina to compensate for said thickness nonuniformity.

4,619,029

METHOD OF RETROFITTING A HAMMER MILL ROTOR

Alton S. Newell; A. Scott Newell, Jr.; Paul D. Popovich, and John R. Ewing, all of San Antonio, Tex., assignors to Newell Industries, Inc., San Antonio, Tex.

Division of Ser. No. 354,286, Mar. 3, 1982, Pat. No. 4,504,019.
This application Mar. 7, 1985, Ser. No. 709,182
Int. Cl.[4] B23P *7/00, 19/04*
U.S. Cl. 29—402.05 **13 Claims**



1. A method of retrofitting a hammer mill rotor having conventional discs initially mounted thereon, comprising the following steps:

removing said rotor from a hammer mill;

removing said conventional discs from a shaft of said rotor;

manufacturing modified discs which are generally circular and have outward protrusions thereon;

forming in said modified discs a means for attaching work hardening caps thereto;

attaching said caps to said modified discs via said attaching means, said caps overlapping said outward protrusions of said modified discs to form generally circular capped discs with a diameter generally the same as said conventional discs;

installing said modified discs on said shaft; and

reinstalling said rotor in said hammer mill.

4,619,030

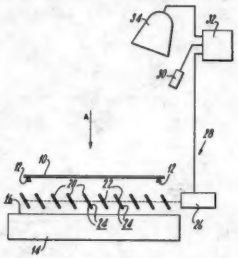
TEMPERATURE CONTROL

Alan D. Marwick, Katonah, N.Y., and Harry C. Sansom, deceased, late of Newbury, England (by Janet Mary Sansom, administratrix), assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jul. 9, 1985, Ser. No. 753,336
Claims priority, application United Kingdom, Jul. 16, 1984, 8418062
Int. Cl.[4] B23Q *15/00;* **F28F** *27/00*
U.S. Cl. 29—404 **8 Claims**

1. An apparatus for controlling the temperature of a specimen undergoing treatment in an evacuated chamber, the apparatus comprising means to support the specimen, at least one heat sink adjacent to but spaced from the specimen, and means situated between the specimen and the heat sink for varying the rate of heat transfer therebetween by radiation.

8. A method for controlling the temperature of a specimen undergoing treatment in an evacuated chamber, the method



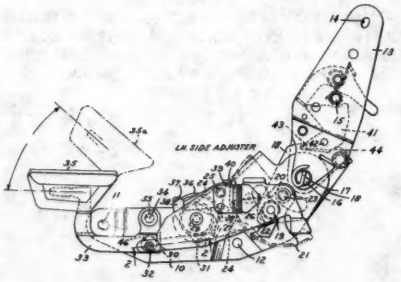
comprising supporting the specimen adjacent to but spaced from a heat sink, and varying the effective thermal emissivity of the surface of the heat sink onto which radiation from the specimen is incident in relation to the temperature of the specimen.

4,619,031

LINKAGE TOLERANCE COMPENSATING SYSTEM

Gerhard Loewe, Battle Creek; Egon Nithammer, Plainwell, and Vikram Zaveri, Springfield, all of Mich., assignors to Keiper Recaro, Inc., Battle Creek, Mich.

Filed Aug. 10, 1984, Ser. No. 639,579
Int. Cl.[4] B23P *11/00, 19/00*
U.S. Cl. 29—434 **8 Claims**



1. A method for fabricating an actuating linkage assembly having a connecting link with two spaced pivot provisions with a tolerance compensating manufacturing system comprising the steps of prefabricating linkage components other than one pivot provision in said link the variable location of which can compensate for composite tolerance variations in the assembled components, preassembling said components on a fixture having locating means for positioning said assembly at a manufacturing station for establishing said one pivot location, locating said assembled components including said link at said station in required final assembled relation, establishing said one pivot provision in said link while said assembled components are located and held in said required relation, and completing said final assembly with said assembly located one pivot provision.

4,619,032

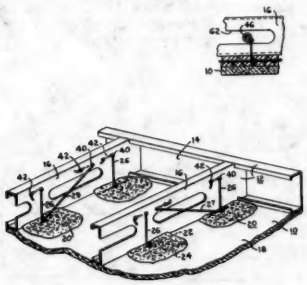
METHOD OF FORMING A COMPOSITE WALL FOR A BUILDING STRUCTURE

David A. Sudrabin, Delray Beach, Fla., assignor to Fibrestone Incorporated, LaBelle, Fla.

Continuation of Ser. No. 594,810, Mar. 29, 1984, and Ser. No. 506,526, Jun. 22, 1983. This application Jul. 24, 1985, Ser. No. 758,321

Int. Cl.[4] B23P *19/04*

U.S. Cl. 29—460 10 Claims



9. The method of forming a composite wall for a building structure having, (a) a relatively thin outer shell formed of fiber reinforced cement and having an outer surface exposed to the atmosphere and an inner surface, and (b) a load supporting structure having a metal frame and spaced metal studs, which comprises the steps of, (1) positioning a preformed fiber reinforced shell horizontally with its outer surface in a face down position, (2) selecting a plurality of spaced patches having intersecting tension members, (3) securing a flex tie connector to intersecting tension members of each of the plurality of selected patches, (4) applying the selected patches to the inner surface of the outer shell with the flex tie connectors projecting upwardly from said patches, (5) applying a slurry of bondable substance to bond the patches to the inner surface of the shell with the flex tie connectors projecting upwardly therefrom in alignment with the location of the studs of the load supporting structure, (6) positioning the spaced metal studs of the load supporting structure of the inner surface of the fiber reinforced shell in alignment with the flex tie connectors, and (7) securing the flex tie connectors to the studs at points remotely spaced from the inner surface of the outer shell.

4,619,033

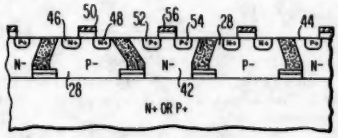
FABRICATING OF A CMOS FET WITH REDUCED LATCHUP SUSCEPTIBILITY

Lubomir L. Jastrzebski, Plainsboro, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed May 10, 1985, Ser. No. 732,605

Int. Cl.[4] H01L *21/365*

U.S. Cl. 29—571 7 Claims



1. A method for forming a CMOS FET structure comprising:

forming an apertured insulating layer on a silicon substrate;

epitaxially forming a monocrystalline silicon island of first conductivity type through an aperture in said layer;

thermally oxidizing the exposed surface of said island so as to form an oxide thereon;

removing the portion of the insulating layer not covered by said oxide; and

forming a monocrystalline silicon island of second conductivity type adjacent to said oxidized silicon island of first conductivity type.

4,619,034

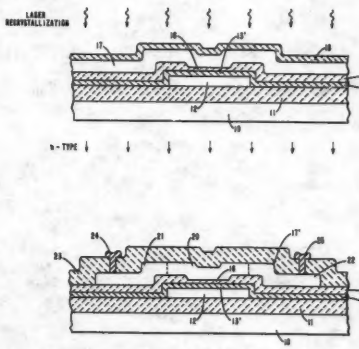
METHOD OF MAKING LASER RECRYSTALLIZED SILICON-ON-INSULATOR NONVOLATILE MEMORY DEVICE

John L. Janning, Dayton, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 490,743, May 2, 1983, abandoned. This application Mar. 11, 1985, Ser. No. 710,192

Int. Cl.[4] H01L *21/263;* C30B *13/06*

U.S. Cl. 29—571 7 Claims



1. A method of forming a nonvolatile semiconductor memory element on a substrate comprising:

forming a conductive gate on a surface portion of said substrate;

forming a composite dielectric layer on said gate and the remaining surface portion of the substrate, said dielectric layer having a relatively small thickness in a central portion of the gate and relatively large thickness in the remaining portion of the gate and the substrate;

forming a doped polysilicon layer on said dielectric layer; and

converting said polysilicon layer into recrystallized silicon.

4,619,035

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE INCLUDING SCHOTTKY BARRIER DIODES

Tadahiko Hotta, and Shingo Sakakibara, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 21, 1985, Ser. No. 747,175

Claims priority, application Japan, Jun. 23, 1984, 59-129681; Jul. 5, 1984, 59-139644

Int. Cl.[4] H01L *21/40*

U.S. Cl. 29—576 C 6 Claims

1. A method of manufacturing a semiconductor device provided with plural kinds of Schottky barrier diodes having different forward voltages on one substrate comprising:

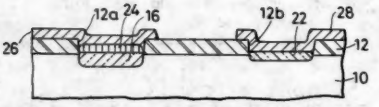
(a) forming at least one Schottky barrier diode of a first kind, by:

(i) placing a first metal layer on a first surface part of a surface of a silicon substrate, and then

(ii) silicifying said first metal layer; and thereafter

(b) forming at least one Schottky barrier diode of a second kind, by

(i) placing a second metal layer indiscriminately both on said first surface part of said silicon substrate as a coating upon each said Schottky barrier diode of said first



kind and on a second surface part of said silicon substrate which is different from said first surface part, this second metal layer consisting essentially of a metal which is different from that of said first metal layer, and then

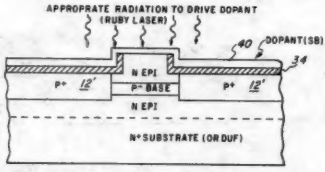
(ii) without first patterning said second metal layer, silicifying said second metal layer.

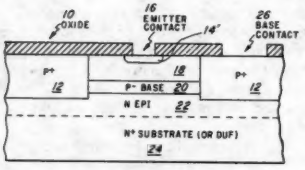
4,619,036

SELF-ALIGNED LOW-TEMPERATURE EMITTER DRIVE-IN

Robert H. Havemann, Garland, and Samuel C. Baber, Richardson, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,070
Int. Cl.[4] H01L *21/265, 21/322*
U.S. Cl. 29—577 C **8 Claims**





1. A process for fabricating integrated circuits comprising bipolar transistors, comprising the steps of:

(a) providing a substrate having, at at least predetermined device locations, first conductivity type collector/emitter regions, second conductivity type base regions above said collector/emitter regions, said first conductivity type surface regions above said base regions, all formed in crystalline semiconductor material having a vertically continuous lattice structure through said collector/emitter, intrinsic base, and surface regions;

(b) partially covering said surface regions with a patterned protective layer, said patterned protective layer exposing portions of said surface layer;

(c) depositing a first-conductivity-type dopant source on said patterned protective layer and the exposed portions of said surface region, and

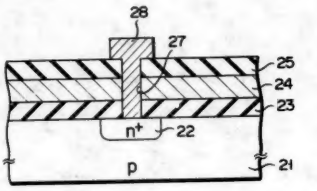
(d) applying transient pulsed radiant heating to said dopant source on the exposed portions of said surface region to form heavily-doped first-conductivity-type emitter/collector regions within portions of said surface region.

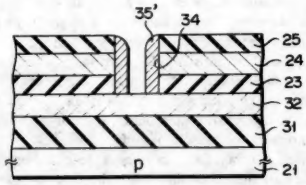
4,619,037

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE

Shinji Taguchi, Yokohama; Homare Matsumura, Kawasaki, and Kenji Maeguchi, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation of Ser. No. 603,699, Apr. 25, 1983, abandoned.
This application Nov. 19, 1985, Ser. No. 798,728
Claims priority, application Japan, May 31, 1981, 58-96126
Int. Cl.[4] H01L *21/44*
U.S. Cl. 29—578 **3 Claims**





1. A method for connecting first and second interconnection layers of an integrated circuit device comprising the steps of:

forming said first interconnection layer of a predetermined pattern,

forming a first insulation film on said first interconnection layer,

forming said second interconnection layer of a predetermined pattern on said first insulation film,

forming a second insulation film on said second interconnection layer,

forming a photoresist layer as a mask on said second insulation film, with a contact opening,

forming a contact hole of uniform diameter in one continuous step extending through said second insulation film, said second interconnection layer, and said first insulation film,

removing said photoresist layer, and

forming a conductive layer of a predetermined pattern extending into said contact hole and connecting said first and second interconnection layers together.

4,619,038

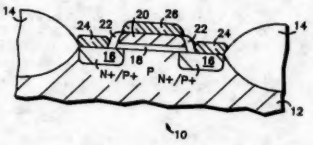
SELECTIVE TITANIUM SILICIDE FORMATION

Faivel S. Pintchovski, Austin, Tex., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 15, 1985, Ser. No. 765,631
Int. Cl.[4] H01L *21/441*
U.S. Cl. 29—590 **13 Claims**

8. A process for producing a semiconductor device comprising a low resistivity layer of titanium silicide selectively overlying a region of silicon comprising the steps of

providing a single crystal silicon substrate,
forming regions of a polycrystalline silicon material,
forming regions of a silicon oxide material in the neighborhood of the polycrystalline silicon material and
forming a titanium silicide layer selectively on the single crystal and polycrystalline silicon material, the improvement comprising reacting a gaseous titanium halide with



the single crystal and polycrystalline silicon material at a temperature in the range of 700° to 1000° C. and a pressure in the range of 0.5 to 1.5 torr in the presence of a stoichiometric excess of hydrogen with respect to said titanium halide gas and in the absence of a silicon-bearing gas to form the titanium silicide layer, in the absence of subsequent anneal and unreacted titanium etch steps.

4,619,039

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE AND DEVICE MANUFACTURED BY THE USE OF THE METHOD

Henricus G. R. Maas; Jan W. Slotboom; Johannes A. Appels, and Kazimierz Osinski, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

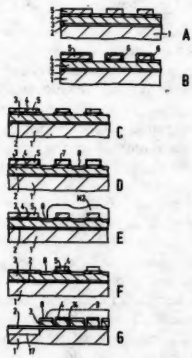
Filed Oct. 4, 1984, Ser. No. 657,644

Claims priority, application Netherlands, Jul. 13, 1984, 8402223

The portion of the term of this patent subsequent to Mar. 11, 2003, has been disclaimed.

Int. Cl.[4] H01L *21/90*

U.S. Cl. 29—591 **7 Claims**



1. A method of manufacturing a semiconductor device having a plurality of adjacent narrow, closely spaced coplanar silicon electrodes, said method comprising the steps of:
(a) depositing on an electrically insulating layer successively a first silicon layer, an oxidation preventing layer, and a second silicon layer;
(b) etching said second silicon layer in a pattern comprising a plurality of parallel silicon strips separated by spacings;
(c) partially oxidizing said pattern to form oxidized edge portions of said pattern;
(d) selectively removing by etching parts of said oxidation preventing layer uncovered by said oxidized pattern;
(e) selectively removing said oxidized edge portions by etching to expose edges of said oxidation preventing layer projecting from under said parallel silicon strips;
(f) applying a first mask to cover said pattern including said spacings except for an area to be situated over a connection region of said first silicon layer;
(g) removing exposed projecting edges of said oxidation preventing layer by etching in said connection region, and removing said first mask thereafter;
(h) oxidizing exposed portion of said first silicon layer in strip-shaped parts of said first silicon layer, said strip-shaped parts being alternately covered by an oxide layer and by said oxidation preventing layer;
(i) applying a second mask over said strip-shaped parts of said first silicon layer and over parts of said first silicon layer to be maintained for interconnections, and etching away unmasked parts of said second silicon layer;
(j) removing selectively exposed parts of said oxidation preventing layer including said exposed projecting edges, and then removing underlying parts of said first silicon layer to form silicon electrodes separated by grooves, said silicon electrodes comprising at least one group of three adjacent parallel silicon electrodes interconnected by said connection region;
(k) filling said grooves at least in part with oxide by thermal oxidation;
(l) separating, in said at least one group, two of said three adjacent silicon electrodes from said connection region and a remaining electrode of said one group by etching to remove selectively area of said first silicon layer;
(m) providing a contact window inside said connection region by selective etching of a layer covering said remaining electrode by using an etching mask overlapping at least one adjacent silicon electrode in a self-aligned manner; and
(n) providing said two silicon electrodes of said group with contact with windows by selectively etching a layer covering said other two electrodes in a self-aligned manner.

4,619,040

METHOD OF FABRICATING STATOR FOR A MULTIPLE POLE DYNAMOELECTRIC MACHINE

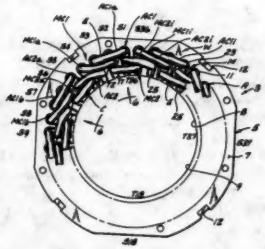
David C. Wang, Allen County, Ind., and Harry W. Voepel, Lincoln County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Continuation of Ser. No. 497,085, May 23, 1983, Pat. No. 4,520,287, which is a division of Ser. No. 315,228, Oct. 27, 1981, Pat. No. 4,426,771. This application Mar. 18, 1985, Ser. No. 713,021

The portion of the term of this patent subsequent to Jan. 24, 2001, has been disclaimed.

Int. Cl.[4] H02K *15/06*

U.S. Cl. 29—596 **7 Claims**



1. The method of fabricating a stator for a multiple-pole dynamoelectric machine, said stator comprising a core assembled from a stack of laminations of suitable ferromagnetic sheet-material, said core having a central bore extending there-

through and a plurality of blind slots extending radially outwardly from said bore, said slots being substantially equally angularly spaced around said bore, said stator including a first winding and a second winding, said windings each comprising a plurality of coils of suitable magnet wire electrically connected to one another and inserted into said slots, each of said coils having a pair of end turns and a pair of generally straight coil sections extending between said end turns, wherein the method of this invention comprises the steps of:

A. forming said first winding by forming a skein of a suitable magnet wire of petalled, serpentine shape defining a plurality coils of a desired size, the number of coils being the same as the number of the poles in said dynamoelectric machine, each of said coils being electrically connected in a desired pattern;

B. forming said second winding by forming a skein of a suitable magnet wire of petalled, serpentine shape defining a plurality of coils of a desired size, the number of coils being the same as the number of poles in said dynamoelectric machine, each of said coils of said auxiliary winding set being electrically connected in a desired pattern; and

C. dividing said first and second windings into at least a first coil set and a second coil set;

D. inserting said coil sets of first and second windings in said slots of said core in the following manner so that the coils of said first and second windings are grouped together in layered fashion in said core by;

i. inserting a first coil of the first coil set of said first winding in said core with said straigth coil sections of this last said first coil being received in a first and a third slot of said core,

ii. inserting a first coil of said first coil set of said second winding in said core with said straight coil sections of said first coil of said first coil set of said second winding being received in a second and a fourth core slot,

iii. inserting a first coil of said first coil set of said first winding in said stator core with said straight coil sections of said last said second coil being received in the third and in a fifth core slot,

iv. inserting a first coil of said second coil set of said second winding in said stator core with the straight coil sections of this last said coil being received in the fourth and in a sixth core slot, whereby the first and second coils of said first and second coil sets of said first and second windings constitute a first layered grouping of coils in a first group of slots of said core, and

v. repeating steps (D) (i) through (D) (iv) to form a second layered group of coils in a second group of slots of said core, and repeating said steps (D) (i) through (D) (iv) until all of said coils are inserted in said core.

4,619,041

METHOD FOR MANUFACTURING COUPLED CAVITY TRAVELLING WAVE TUBES

Peter R. Davis, Witham; Brian F. Cooper, Chelmsford, and David H. Cottey, East Hanningfield, all of England, assignors to English Electric Valve Company Limited, Chelmsford, England

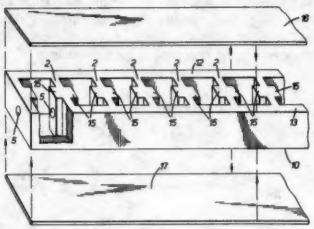
Filed Oct. 5, 1983, Ser. No. 539,147

Claims priority, application United Kingdom, Oct. 6, 1982, 8228614; Oct. 27, 1982, 8230702

Int. Cl.[4] H01P *11/00;* **H01Q** *13/00*

U.S. Cl. 29—600 **21 Claims**

1. A method of constructing a coupled cavity travelling wave tube including the steps of forming a slow wave structure therefor of at least one longitudinally extending member having front and rear longitudinally extending faces, and utilising a hobbing technique for forming in one bobbing operation a plurality of holes through said at least one member, with said holes being hobbed right through from the front longitudinally extending face to the rear longitudinally extending face and



each hole constituting at least part of a whole cavity in the completed slow wave structure.

4,619,042

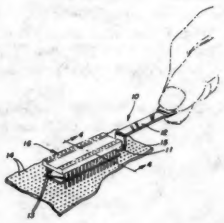
METHOD FOR ALIGNMENT AND INSERTION OF AN ELECTRIC MODULE

William M. Halstead, 709 Yale Ave., Baltimore, Md. 21229

Continuation of Ser. No. 535,051, Sep. 23, 1983, abandoned. This application Jun. 14, 1985, Ser. No. 744,659

Int. Cl.[4] B23P *19/00*

U.S. Cl. 29—837 **5 Claims**



1. A method for installing an electrical module on a printed circuit board or the like where the module comprises a flat body portion and two parallel rows of longitudinally spaced terminal leads insertable in correspondingly spaced rows of apertures in the board and where the leads may be required to be straightened and aligned before insertion, said method comprising the steps of:

a. applying the module to a tool which comprises an elongated planar blade and an integral handle offset from the blade and forming a longitudinal extension thereof, the blade having opposite parallel side edges perpendicular to the plane of said blade and a plurality of longitudinally spaced slots formed in each side edges, the longitudinal spacing of the slots of each edge corresponding to the correct longitudinal spacing of the leads in each row and the slots in the opposite side edges being transversely aligned and perpendicular to the plane of said blade, each of said slots being defined by an open front in one of said side edges, a pair of side walls extending inwardly from said open front and a rear wall connecting said side walls, the distance between rear walls of transversely aligned slots in said opposite side edges corresponding to the correct distance between transversely aligned leads in said two rows, and the distance between side walls of each slot at said open front being just sufficient to permit entry of one of said leads into said slot and the seating thereof against said rear wall, said step of applying said module to said tool comprising supportin, the module with said leads extending upwardly from said body portion, holding said tool by said handle with the blade offset upwardly

from said handle, positioning said blade in overlying relationship to said module with the slots in said opposite side edges approximately aligned with said two rows of leads, inclining and lowering said blade relative to said module so that said blade is positioned between said leads with one edge turned down toward the body of said module and the other edge turned upwardly away from the body of said module, turning said blade between said leads with said slots in said side edges in transverse alignment with said leads of said two rows of leads until said blade is parallel to and spaced outwardly from the body of said module and until said leads are seated in said slots whereby said leads in said two rows are forced into their correct longitudinal spacing and the tranversely aligned leads in said two rows are forced apart a distance, equal to at least the correct transverse distance between leads in said two rows, manipulating any leads extending outwardly from said slots into said slots, translating said blade toward but short of the free ends of said leads,

b. with said module supported by said tool, turning said tool and module over until said leads extend downwardly from the body portion of said module,

c. positioning said module supported by said tool and with said leads extended downwardly over a circuit board and aligning said two rows of leads over two rows of apertures in said circuit board,

d. pressing said tool with said module supported thereon downwardly until said two rows of leads enter and extend through said two rows of apertures,

e. rotating said blade to an inclined position relative to said leads and retracting said blade until it is free from the now partially mounted module, and

f. pressing the body of said module toward said circuit board until it is fully installed thereon.

4,619,043

APPARATUS AND METHOD FOR MOUNTING CHIP TYPE ELECTRONIC PARTS

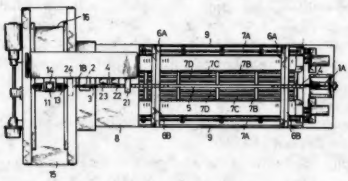
Tetsuo Takahashi; Yoshinobu Taguchi, and Kenichi Saito, all of Tokyo, Japan, assignors to TDK Corporation, Japan

Filed Mar. 19, 1984, Ser. No. 591,190

Claims priority, application Japan, May 2, 1983, 58-76205; May 19, 1983, 58-73690[U]; May 19, 1983, 58-73691[U]; Jun. 2, 1983, 58-82970[U]; Jun. 6, 1983, 58-85019[U]; Jun. 13, 1983, 58-89175[U]; Jun. 23, 1983, 58-96956[U]

Int. Cl.[4] **H05K** *3/34;* **B23P** *19/00;* **B65G** *29/00*

U.S. Cl. 29—840 **15 Claims**



1. A method for mounting chip type electronic parts having leads extending therefrom, comprising the steps of

supplying the part onto means for conveying the same to be mounted,

positioning the part on said conveying means,

detecting presence/absence of the part on said conveying means, after positioning of the same upon said conveying means,

removing the part off said conveying means and mounting the same, and

transforming the individual chip type part after the positioning step and before the detecting step, so that a tip of a lead thereof and a bottom surface of the electronic part are disposed in substantially the same plane.

3. An apparatus for mounting a chip type part for electronic application to a printed circuit board, comprising

means for conveying the part to be mounted,

means for supplying the part onto said conveying means,

means for receiving the part from said conveying means and for mounting the same, and

means for positioning the part upon said conveying means before transferring the same to said receiving and mounting means, wherein

said conveying means comprise an endless belt having a portion running in a substantially horizontal plane and a portion passing through a substantially vertical direction, said belt adapted to carry a series of pallets for receiving the part from said supplying means;

said supplying means comprise at least one supply unit disposed on either side of the horizontal portion of said belt, and

said receiving and mounting means comprise at least one mounting head for receiving the part at a particular position from the pallet, and for mounting the same upon the printed circuit board.

14. A pallet for conveying a chip type part, comprising

a base,

a pair of retaining bars disposed on said base and adapted to retain the part disposed thereon, and

means for urging said retaining bars close to one another to retain the part on the pallet.

4,619,044

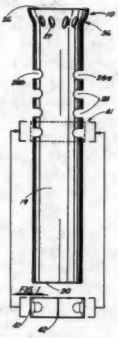
APPARATUS TO AID IN PRECISION HAIRCUTTING

Robert A. Dennis, 103 N. DeVilliers, Pensacola, Fla. 32501

Filed Aug. 8, 1984, Ser. No. 638,903

Int. Cl.[4] **B26B** *19/20, 19/44*

U.S. Cl. 30—133 **11 Claims**



1. An apparatus to aid in the cutting of hair used in combination with the sorce of suction and haircutting means comprising;

a. an elongated cylindrical open-ended member having a bore longitudinally therethrough, the first end portion thereof adapted to abut the scalp of the head of hair to be cut, and the second end portion thereof adapted to communicate with said source of suction;

b. a plurality of spaced inlet ports provided in said first end portion of said member for permitting the entry of air into said member when said first end portion of said member abuts said scalp and said second end portion of said member is provided with a source of suction thereby allowing the force of said suction to entrain said hair longitudinally of said bore;

c. a plurality of longitudinally spaced openings provided in said member intermediate said end portions for selectively introducing into said member means for cutting said hair entrained longitudinally of said bore; and

d. a plurality of means slidably mounted on said member for

selectively sealing all but one of said plurality of longitudinally spaced openings in said member while said source of suction is applied, wherein said means for selectively sealing said longitudinally spaced openings include a split ring having protrusions depending from its internal perimeter for engaging said openings of said member when said means is mounted on said member.

4,619,045

HEDGE TRIMMER

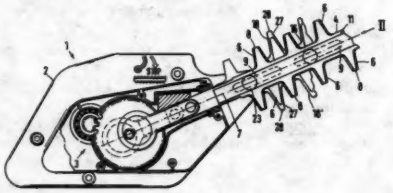
Günter Mayer, Untereisesheim, Fed. Rep. of Germany, assignor to Andreas Stihl, Waiblingen, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,459

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1984, 8419115[U]

Int. Cl.[4] B26B *19/02*

U.S. Cl. 30—216 **20 Claims**



1. A hedge trimmer comprising:

a housing;

a guide bar having two flat sides and being mounted on said housing, the guide bar defining a longitudinal axis;

a pair of elongated flat cutters journalled for reciprocal movement on one of the flat sides of said guide bar so as to cause one of said cutters to be sandwiched between said one flat side and the other one of said cutters;

reciprocating drive means for reciprocating said cutters in mutually opposing movement along said axis;

each of said cutters having a plurality of cutting teeth projecting laterally of said axis;

an elongated cover mounted on said guide bar and being formed to define a substantially U-shaped channel having an elongated recess for accommodating said guide bar therein;

said cover having a plurality of protective teeth projecting laterally and outwardly from the legs of said channel so as to be parallel and adjacent to said cutting teeth;

said protective teeth having respective end portions overlapping and projecting outwardly beyond said cutting teeth; and,

said channel having a depth corresponding substantially to the thickness of said guide bar so as to cause said one flat side to be flush with said protective teeth and to place said one cutter directly next to said protective teeth thereby defining a very narrow glide cap between said one cutter and said protective teeth so that practically no sliding friction can occur therebetween.

4,619,046

PINEAPPLE EYE EXTRACTOR

Victor H. Goulter, 485 Molimo Dr., San Francisco, Calif. 94127

Continuation of Ser. No. 623,712, Jun. 22, 1984, abandoned. This application Dec. 4, 1985, Ser. No. 804,246

Int. Cl.[4] B26B *13/00*

U.S. Cl. 30—229 **9 Claims**

1. An extractor for removing the eyes of fresh produce rapidly, comprising:

a pair of elongated members, one being a cutting member and the other being an anvil member,

each of said members being pivotably attached to the other of said members at a location spaced from both ends of each member by a pivot,

the part of each member on one side of said pivot comprising a jaw section,

the other part of each member on the other side of said pivot comprising a handle section,

the jaw section of said cutting member being U-shaped,

the bight portion of said "U" being distal from said pivot and the legs of said "U" being connected to said pivot so as to form an opening,

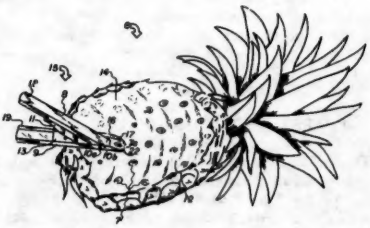
said "U" being formed of a flat, elongated strip of material having two major opposing surfaces of a relatively broad width and two relatively narrow edges joining said major surfaces,

one of said major surfaces being the inside surface of said "U",

said inside major surface of said strip having one portion which forms a surface of one leg of such "U" and which faces another portion of said inside major surface of said "U", the other portion of said inside major surface forming a surface of the other leg of said "U",

the outer surface of said bight portion being the other of said two major surfaces of said strip of material, being free and constituting the end of said cutting member,

one of said two edges of said bight portion being sharpened so as to form a U-shaped cutting edge,



said cutting edge lying in a plane which is parallel to the axis of said pivot and oriented so that it moves in a circle concentric to said pivot when said cutting member is rotated with respect to the other of said members about said pivot,

the jaw section of said anvil member

being substantially straight so as to be easily insertable into an item of produce,

being substantially flat at its end and having two opposed major surfaces at such end and two opposed minor surfaces interconnecting said major surfaces,

one of said major surfaces of said end of said jaw section

(a) lying in a plane which is parallel to the axis of said pivot,

(b) facing said cutting edge of said bight portion, and

(c) having a sharpened end such that it can be inserted diagonally into the surface of a piece of produce and extend under an eye thereof,

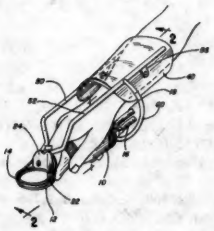
whereafter said eye will be positioned on said one major surface of said jaw section of said anvil member so that upon rotation of said two members together, said U-shaped cutting edge of said bight portion will meet said jaw section of said anvil member and sever said eye from said piece of produce.

4,619,047

MEAT TRIMMING KNIFE WITH WRIST STRAIN RELIEF DEVICE

Sandy D. Heckman, Memphis, Tenn., assignor to John Morrell & Company, Northfield, Ill.

Filed Jan. 31, 1985, Ser. No. 698,826
Int. Cl.[4] B26B 7/00
U.S. Cl. 30—276 4 Claims



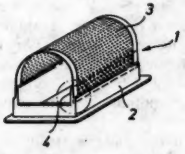
1. A hand held meat trimming knife having a wrist strain preventing device comprising, a manually-grippable cylindrical knife body, a knife mounting extending beyond one end of said knife body, means connecting the knife mounting to the knife body, a circular knife blade drivingly mounted in said knife mounting and having a cutting action by movement along a workpiece and pressure resulting from a manually-applied downward force, and a forearm-engaging force reaction means to relieve pressure on a user's wrist including an arcuate downwardly concave elongate shield for overlying a user's forearm, and mounting means connecting said shield to said knife body including a mounting plate held to the knife body by said connecting means.

4,619,048

METHOD FOR FORMING COMPOSITE PART COMPRISING A PLASTIC FRAME AND A PERFORATED METAL FOIL

Albert Greutert, Sonnhalde, 6072 Sachseln, Switzerland

Filed Apr. 25, 1984, Ser. No. 603,548
Claims priority, application Fed. Rep. of Germany, May 2, 1983, 3315887
Int. Cl.[4] B26B 19/04
U.S. Cl. 30—346.51 3 Claims



1. An improved method for manufacturing and injection molding an improved composite part for use as a shaving head in dry razors, comprising the steps of:

providing a generally planar partially perforated metal foil, bent to provide a shaving head;

providing a mold with a recess suitable for injection molding of the composite part consisting of the foil and a frame having an affixing area along which at least one edge of the foil will be embedded in the frame and a transition region adjacent the affixing area in which one surface of the foil will abut the frame and the other surface thermally abut the mold;

providing the foil with at least one attachment orifice disposed in the transition region and providing the mold with a corresponding recess for forming at least one attachment protrusion for mating engagement with the at least one attachment orifice;

inserting the foil within the mold; and

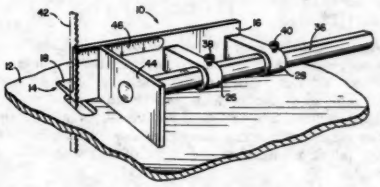
injecting the flowable plastic into the mold.

4,619,049

CENTERING DEVICE AND METHOD

William J. Griffin, P.O. Box 26, Walker Springs, Ala. 36586

Filed Feb. 7, 1985, Ser. No. 699,439
Int. Cl.[4] B26D 7/06; B27C 5/02
U.S. Cl. 33—185 R 7 Claims



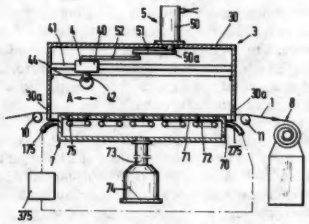
1. A centering device to be mounted on a band saw table or other machine tool location for use in accurately determining the center of the ends of wood stock for use such as in a wood turning operation, comprising: a stop member formed of longitudinally extending horizontal and vertical planar portions attached along respective longitudinal edges at right angles to form an L-shaped cross-section; an adjustable fence including a rod member having a generally rectangular plate mounted at one end thereof; said plate having one surface thereof contiguous with the vertical portion of the stop member and wherein said horizontal portion of the stop member extends from the vertical portion in a direction opposite to that of said plate; and means for mounting said rod member on the stop member to permit sliding movement of said fence relative to the stop member in a direction parallel to the longitudinal axis of the stop member.

4,619,050

APPARATUS FOR DRYING SHEET- OR WEB-LIKE MATERIALS WITH ULTRAVIOLET RADIATION

Gerhard Klemm, Am Rehwinkel 37, D-4800 Bielefeld 1, Fed. Rep. of Germany

Filed Apr. 15, 1985, Ser. No. 723,427
Int. Cl.[4] F26B 23/04
U.S. Cl. 34—4 28 Claims



1. Apparatus for drying moisture-containing sheet-like materials, particularly for drying coated or impregnated webs of paper, textile material and the like, comprising means for advancing a material to be dried along a predetermined path and in a predetermined direction; at least one source of ultraviolet radiation adjacent to one side of said path; and means for

moving said source with reference to said path, said moving means including a carriage for said source, an arcuate guide for said carriage, and means for reciprocating said carriage along said guide.

4,619,051

PROCESS FOR DRYING POLYMERIC BEADS AND ASSOCIATING SHADING PIGMENTS THEREWITH

Laura M. Wells, Mt. Prospect; Fred D. Hawker, Villa Park; Maryam L. Dachniwskyj, and Charles W. Strobel, both of Schaumburg, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Division of Ser. No. 658,625, Oct. 9, 1984, Pat. No. 4,599,807. This application Nov. 4, 1985, Ser. No. 794,431

Int. Cl.[4] F26B *3/00*

U.S. Cl. 34—9 **4 Claims**

1. A process for drying a water-wet paste containing vesiculated polymeric beads without agglomeration comprising, adding to said wet paste a proportion of an organic solvent which forms an azeotrope with water in an amount providing a stirrable mixture, and heating the solvent-containing aqueous paste to remove the water as an azeotrope with said solvent and to produce a water free suspension of said beads in organic solvent.

4,619,052

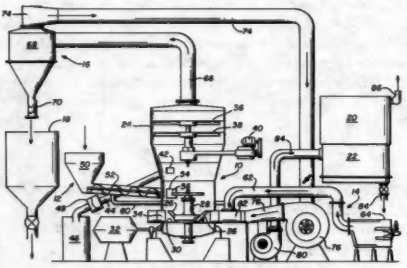
PROCESS AND APPARATUS FOR DRYING AND CLASSIFYING PARTICULATE GRANULATE MATERIAL

Larry E. Osburn, Harlingen, and Melvin W. Wells, Spring, both of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Jun. 17, 1985, Ser. No. 745,180

Int. Cl.[4] F26B *3/10*

U.S. Cl. 34—10 **2 Claims**



1. A process for drying a moist particulate ground specular hematite in a material handling system including a pneumatic conveyor, a mixer, a product separator, and a waste product separator, comprising continuously charging preheated particulate hematite having a moisture content of about 7 to about 10 weight percent by means of a screw conveyor into a mixer; continuously stirring the moist hematite in the mixer with a hot air moving in a forced hot air system by passing hot air upward through the mixer thereby agitating the moist material between rotating blades operable in displacing the moist material in an upwardly direction in an air flow dehydration of the material by introducing the hot air flow at a location below the rotating blades in a swirling flow substantially uniformly around a zone in the mixer below the rotating blades for movement upward through the mixer so as to pass the hot air upwardly to surround and pass the rotating blades; passing the material through a rotary screen comprising a pair of rotating multi-vained blades rotating at a relative speed such that finely divided materials pass in an upward direction and particles greater than approximately 200 mesh in span are rejected downwardly; and removing the oversized particles of material from said air stream that do not pass through the rotating screen and discharging them from the mixer; said stirring and said agitating occurring in an air pressure zone that is below atmospheric pressure while regulating the flow of moist particulate granulate material to said mixer and the moisture removal from the air in order to dehydrate the moist particulate granulate material to a product having approximately less than about 0.3 weight percent of moisture content; separating dried material from the air in the air flow in a product separator and collecting the dried granular particulate material product; and separating moisture and dust from a portion of the air stream in a waste product separator and recycling the remainder of the hot air into the mixer.

4,619,053

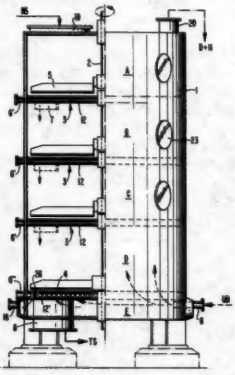
PROCESS AND APPARATUS FOR DESOLVENTIZING FLAKY OR GRANULAR VEGETABLE RESIDUE MATERIAL OBTAINED IN THE EXTRACTION WITH ORGANIC SOLVENTS

Heinz O. Schumacher, Höperfeld 26, D-2050 Hamburg 80, Fed. Rep. of Germany

Filed Oct. 7, 1983, Ser. No. 539,796

Int. Cl.[4] F26B *3/16*

U.S. Cl. 34—12 **22 Claims**



1. Process for desolventizing residue material obtained in the extraction of substances with organic solvents so as to remove fire and toxicity hazards affecting shippers and consumers, the desolventizing being effected with superheated steam or superheated steam-containing fluids in continuous operation in countercurrent, wherein the solvent-wet material to be desolventized is conducted in opposition to said steam or steam-containing fluid, falling downwardly by gravity through one treatment stage or a plurality of treatment stages, the individual treatment stages being defined by perforated plates having overflow means, agitating means being moved slightly above said perforated plates, the space below the lowermost perforated plate serving to distribute the steam, said apparatus being characterized in that the perforated plates defining the respective treatment stages are double bottoms capable of being heated by means of steam, said double bottoms having bores formed by individual distance pieces or spacers each having a bore therethrough, the cross-section of said bores being such as to allow the passage of upwardly streaming steam or steam-containing fluid, but not the passage or the entrapment of the material being moved on the bottoms, said process being characterized in that the steam being used for desolventizing is present in superheated form at a temperature of at least 120° C. (248° F.) (normal pressure), particularly at least 130°–180° C. (266°–356° F.), preferably up to 220° C. (428° F.), in that at least 45%, but particularly 100% of said superheated steam is introduced below the lowermost perforated plate, which serves to distribute the steam, and in that the escaping vapors

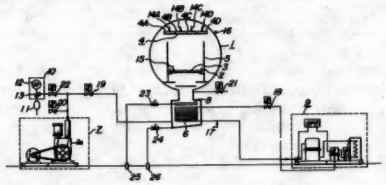
of steam and solvent are obtained at a temperature of about 64°–69° C. (147.2°–156.2° F.).

4,619,054

APPARATUS FOR PRODUCING REFRESHABLE DRY MEAT

Masami Sato, 29-3-401, Minamidai 2-Chome, Nakano-Ku, Tokyo, Japan, assignor to Stephano & Co., Ltd., Yokohama and Masami Sato, Tokyo, both of, Japan

Division of Ser. No. 570,848, Jan. 16, 1984, abandoned. This application Sep. 30, 1985, Ser. No. 782,598
Claims priority, application Japan, Nov. 4, 1983, 58-205897
Int. Cl.[4] F26B *5/06;* A23B *4/06*
U.S. Cl. 34—92 **4 Claims**



1. An equipment for producing refreshable dry meat comprising:

a vacuum chamber having a tray therein for supporting meat to be processed;

an infrared ray heater located within said vacuum chamber spaced from and facing said tray for irradiating said meat, said infrared heater emitting radiation having a wavelength of at least 5 μm;

a vacuum pump connected to said vacuum chamber for reducing the pressure therein to a value within the range 20 Torr to 1 Torr for cooling said vacuum chamber to a temperature within the range −5° C. to −20° C., thereby effecting vacuum-drying of said meat at a temperature within said temperature range;

a cold trap disposed within said vacuum chamber for condensing moisture evaporated from said meat by the radiation emitted from said infrared heater, thereby accelerating reduction of the pressure within said chamber;

a refrigerator coupled to said cold trap for cooling said cold trap;

a vacuum regulator for maintaining the vacuum within said chamber within said pressure range;

temperature sensor means for insertion in said meat to detect the temperature thereof;

first temperature regulator means coupling said temperature sensor means to said infrared ray heater, said first temperature regulator means controlling the temperature of said infrared ray heater in accordance with the detected temperature of said meat, the temperature of said infrared ray heater being controlled in a range of +25° C. to +200° C.;

second temperature regulator means coupled to said temperature sensor means for terminating the operation of said infrared ray heater when the temperature of said meat reaches a predetermined value in a range of +20° C. to +40° C., said predetermined value being a temperature high enough to dry said meat and low enough not to detrimentally affect the texture of said meat;

vacuum gauge means connected to said vacuum chamber for detecting the pressure therein; and

control means coupling said vacuum gauge to said vacuum regulator, said vacuum being actuated to maintain a vacuum within said vacuum chamber to between 20 Torr and 1 Torr in accordance with the pressure detected by said vacuum gauge means, whereby the temperature of said vacuum chamber is maintained within the range of −5° C. to −20° C.

4,619,055

CUSHIONING PAD

Murray R. Davidson, P.O. Box 27087, San Diego, Calif. 92128

Filed Oct. 29, 1984, Ser. No. 666,273
Int. Cl.[4] A43B *13/18*
U.S. Cl. 36—28 **5 Claims**

1. A cushioning mat comprising:

(a) an upper laminate of material having moisture-absorbant characteristics;

(b) an intermediate laminate having an upper and lower surface, said upper surface being bonded to the lower surface of said upper laminate, said intermediate laminate being resilient and permanently deformable over prolonged application of pressure;

(c) a lower cushioning pad having a base layer having an upper and lower surface, said upper surface of said base layer being bonded to the lower surface of said intermediate layer;

(d) a plurality of generally spaced-apart longitudinally and transversely extending ribs extending from the lower surface of said base defining a plurality of cells, said ribs having memory to return to the original shape upon removal of deformation forces and being resilient to flex and deform under application of pressure to cushion shock; and

(e) said ribs defining first air passageways placing said cells in communication with one another and wherein said laminate and pad define second air passageways at selected locations whereby air flow is induced through the mat and between the cells as the mat is flexed.

4,619,056

INSOLE WITH RIBBED ARCH STRUCTURE

Mark Y. Lin, Taichung, China, and James C. Autry, Dallas, Tex., assignors to Autry Industries, Inc., Dallas, Tex.

Filed Mar. 28, 1985, Ser. No. 716,966
Int. Cl.[4] A43B *13/40, 21/32*
U.S. Cl. 36—43 **7 Claims**

1. An insole for insertion into a shoe to provide support for the foot, comprising:

a layer of cushioning material fabricated from a resilient material and having an upper surface for being disposed adjacent the sole of the foot and generally having a profile around the perimeter thereof similar to that of the foot, a lower surface of said cushioning layer opposed to said upper surface, said cushioning layer having:

a heel portion for disposal adjacent the heel of the foot;

a mid portion for disposal adjacent the arch of the foot; and

a toe portion for disposal adjacent the toes of the foot;

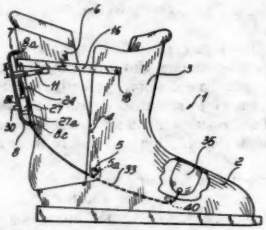
said mid portion having a plurality of substantially triangular ridges formed on said lower surface, said ridges disposed in spaced-apart relationship and extending from the medial side of said insole substantially across to the lateral side of said insole, said ridges forming arcs of concentric circles having a common radial center and dimensioned such that the apex of said triangular ridges is located proximate the arch of the foot, said ridges operative to create a raised portion on said upper surface at said mid portion to provide support for the arch of the foot.

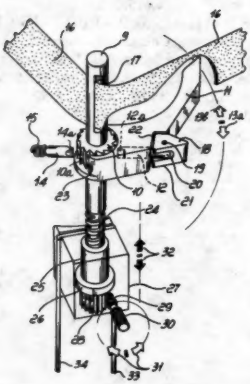
4,619,057

TIGHTENING AND ADJUSTING DEVICE PARTICULARLY FOR SKI BOOTS

Leo Sartor, Caerano, and Franco Gobbo, Falzè Di Trevignano, both of Italy, assignors to Caber Italia S.p.A., Montebelluna, Italy

Filed May 28, 1985, Ser. No. 738,338
Claims priority, application Italy, Jun. 1, 1984, 41587 A/84
Int. Cl.[4] A43B *11/00, 5/04*
U.S. Cl. 36—50 **4 Claims**





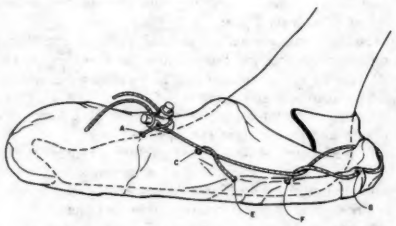
1. A tightening and adjusting device particularly for ski boots including a shell having an instep portion, and a leg portion defining a quarter, including two sections articulated to each other, said device comprising entrainment means, actuating means, housing means, traction means, adjustment means and at least one stay member, said stay member defining a working length and having an entrainable portion and at least one end said at least one end being attached to one of said two sections, said entrainable portion being adapted to be entrained by said entrainment means, said entrainment means being adapted for co-operation with said actuating means for adjusting said working length defined by said stay member, said actuating means comprising an axle having rigidly associated therewith an inclined toothed gear wheel, said axle and said gear wheel being actuable by a ratchet lever, said device further comprising a presser element adapted for exerting pressure at said instep portion, at least one link element including a tractable portion, defining a working length dimension and having attached to said presser element, at least one end, said housing means being adapted for at least partially containing said entrainable portion of said stay member said actuating means and said entrainment means, said traction means including a thread formation, a sleeve having an outer flange, and a guided block, said thread formation being threaded into said sleeve, said sleeve being rotatably arranged in said guided block, said outer flange of said sleeve being contained in said guided block to prevent relative axial movement of said sleeve with respect to said guided block, said adjustment means including a gear, and a worm including a middle pin said gear being formed on said sleeve, said-middle pin protruding from said guided block for allowing manual actuation thereof, which by obtaining the rotation of said sleeve determines a mutual position of said guided block with respect to said axle, prior to rotation of the latter by actuation of said ratchet lever, said adjustment means being adapted for varying said working length dimension defined by said at least one link element independently of said actuating means.

4,619,058

FOOTWEAR CORRESPONDING TO PHYSIOLOGY

Jerry F. Gumbert, P.O. Box 02011, Columbus, Ohio 43202-2011

Filed Apr. 30, 1985, Ser. No. 728,857
Int. Cl.[4] A43B *1/10*
U.S. Cl. 36—102 **2 Claims**



1. Footwear comprising a unitary shell enveloping the foot, having a heel collar and an incision therein adopted to accommodate a foot inserted therein, said shell including elastic interconnections between points therein at locations adjacent the following anatomical features on the medial side of the shoe:

(1) beginning above the base of first metatarsal and corresponding to the extensor longus hallucis;

(2) to the side of the most anterior, inferior aspect of the medial side of the extensor retinaculum;

(3) to the location of attachments of the tibialis anticus;

(4) to the attachments of the tibialis posticus;

(5) to the medial side and anterior portion of the calcaneus and corresponding to the flexor retinaculum;

(6) to the medial inferior attachment of achilles tendon;

(7) to the medial and lateral superior aspects of the calcaneus and the planaris; and

(8) to the medial and lateral aspects corresponding to where the soleus attaches to the achilles tendon.

and at locations adjacent the following anatomical features on the lateral side of the shoe:

(1) beginning above the base of the 4th metatarsal and corresponding to the extensor longus digitiorim;

(2) to the side of the peroneus tertius and corresponding to the lateral side of the extensor retinaculm;

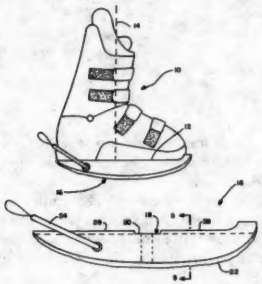
(3) to the side of the attachment of the peroneous brevis;

(4) to below the lateral malleolus and corresponding to the abductor minimui digiti and peroneus longus;
(5) to the lateral and anterior part of calcaneus and corresponding to the peroneal retinaculum;
(6) to the lateral inferior attachment of achilles tendon;
(7) to the medial and lateral superior aspects of the calcaneus and the plantaris; and
(8) to the medial and lateral aspects corresponding to where the soleus attaches to the achilles tendon.

4,619,059
BOOT ACCESSORY

Wayne A. Koniuk, 324 Divisadero St., San Francisco, Calif. 94117

Filed Aug. 2, 1984, Ser. No. 637,120
Int. Cl.[4] A43B *5/00, 5/04, 5/18*
U.S. Cl. 36—132 **10 Claims**



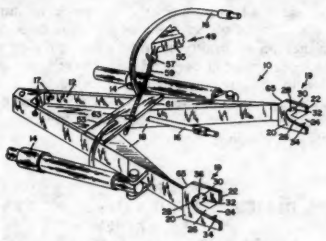
1. A boot accessory removably attached to the underside of a downhill ski boot which, when worn on the foot of an individual user, locks the user's ankle in place within the boot, said accessory comprising: an accessory body having a topside, an underside and an outer periphery which corresponds generally to the underside of said boot and thereby includes a lengthwise axis and a shorter widthwise axis; and means for removably attaching said accessory body to said boot so that it topside confronts the boot's underside, whereby to cause the user to walk on the underside of the accessory body rather than the boot; said accessory body being constructed so as to be resiliently deformable under the weight of the user at substantially all points along its lengthwise and widthwise axes and sufficiently thick so that the resilient deformation causes the underside of the accessory body to deform and does not cause its topside to deform in order to cause the underside of the accessory body to flex relative to its topside and thus conform to irregular or inclined surfaces without causing the topside to do so.

4,619,060
PLOW COUPLING

Leland P. Knowlton, 80 Forest St., Worcester, Mass. 01609

Filed Jul. 2, 1985, Ser. No. 751,247
Int. Cl.[4] E01H *5/06*
U.S. Cl. 37—231 **18 Claims**

1. Coupling for a plow comprising:
(a) a supporting frame which is attachable to the back side of a plow, said frame having a pair of spaced rearwardly extending arms, and
(b) a mounting tab which is rigidly attached to the rearward end of each arm, said tab comprising a flat plate which includes a rear edge, an opening at said rear edge, a first slot which extends forwardly from the opening and which terminates in a forward edge, and a second slot which extends rearwardly from the forward end of said first slot and which terminates in a rearward edge, said opening being adapted to receive a connecting pin of a push beam which is attached to a plow pushing vehicle, when said rear edge is moved toward said pin at a right angle to the longitudinal axis of said pin, said first slot being adapted to receive said pin so that the pin rests against said forward

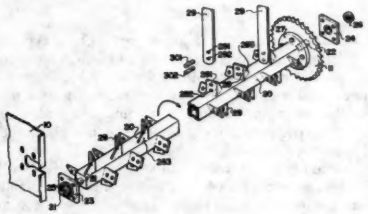


edge when the plow is pushed forwardly by the vehicle and said second slot being adapted to receive said pin from said first slot so that said pin rests against said rearward edge when the plow is being pulled rearwardly by the vehicle.

4,619,061
SNOWBLOWER

John L. Swanson, 1302 Louise Ave., Saskatoon, Saskatchewan, Canada S7H 2P9

Continuation-in-part of Ser. No. 551,356, Nov. 14, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,174
Claims priority, application Canada, Dec. 24, 1982, 418629
Int. Cl.[4] E01H *5/09*
U.S. Cl. 37—248 **1 Claim**



1. A snowblower comprising a casing for moving in a forward direction across ground to be clear of snow having an open front face for engaging the snow, an auger mounted in the casing for rotation about a substantially horizontal axis transverse to the forward direction, so as to move snow longitudinally of the auger towards an opening in the casing, and a fan mounted in the casing for withdrawing snow from the opening for discharge from the blower, the auger comprising a shaft which is square in cross section defining four sides, bearing means for mounting the shaft for rotation about said axis, means for rotatably driving the shaft, a plurality of blades, each blade comprising a planar rigid thin metal sheet which elongate, narrow and rectangular so as to define parallel side edges, an a plurality of mounting means each mounting a respective one of the blades on said shaft for rotation therewith so that rotation of the shaft causes snow engaged by the blades removed axially of the shaft for collection, each said mounting means comprising a rectangular flat plate having one edge attached to a respective side of the shaft and extending outwardly therefrom at right angles thereto and canted at an angle to the axis of the shaft, and a supporting web interconnecting a side edge of the plate to the side of the shaft, and including a first hole therethrough for receiving a pivot pin passing

through said plate and through the respective blade for mounting said blade on said shaft so as to be parallel to the plate and pivotable about an axis at right angles to the plate and including a second hole therethrough for receiving a shear pin through said plate and through said blade arranged to normally prevent such pivotal movement, so as to maintain said blade with the side edges thereof at right angles to the respective side and to shear to allow such pivotal movement on impact of said blade with a solid object, each of the four sides of the shaft having thereon a plurality of said mounting means and respective blades arranged at one angle thereto to move snow in one direction therealong towards said opening and a plurality of said mounting means and respective blades arranged at another angle to move snow in an opposed direction therealong towards said opening.

4,619,062

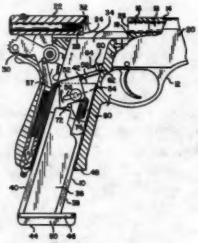
SAFETY DEVICE FOR FIREARMS USING REMOVABLE MAGAZINES

David A. Johnson, 3432 Tanglewood Way, Salem, Oreg. 97302

Filed Oct. 8, 1985, Ser. No. 785,577

Int. Cl.⁴ F41C *11/02*

U.S. Cl. 42—70.11 **20 Claims**



1. A safety device for use in a firearm, of the type having a barrel defining a cartridge receiving and firing chamber having a breech opening, a longitudinally movable breech-closing member, and a magazine well for receiving and holding a removable magazine capable of holding a cartridge to be fed into the cartridge receiving and firing chamber, the safety device comprising:

(a) a main body of a size and shape which fits within said magazine well, preventing insertion of a magazine thereinto, said main body including an inner end and an outer end;

(b) a chamber-blocking element; and

(c) connecting means attached to said main body for connecting said chamber-blocking element movably thereto, said chamber-blocking element being movable between a first position, in which said chamber-blocking element is aligned with said main body so that said main body can be inserted into said magazine well preceded by said chamber-blocking element, and a forwardly located second position in which at least a portion of said chamber-blocking element obstructs said breech opening, preventing insertion of a cartridge into said cartridge receiving and firing chamber.

4,619,063

REVOLVING MAGAZINE FOR PISTOLS

Charles Hill, and George Spector, both of 233 Broadway Rm 3615, New York, N.Y. 10007

Filed Jan. 23, 1985, Ser. No. 694,122

Int. Cl.⁴ F41C *25/06*

U.S. Cl. 42—7 **3 Claims**

1. A pistol having a barrel and bolt which comprises:

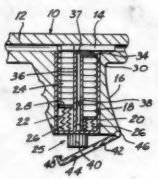
(a) a handle having a cylindrical bore extending within;

(b) a cylindrical magazine having a plurality of radial chambers wherein said chambers can hold a plurality of cartridges, said magazine is removeably secured within said bore;

(c) means for revolving said magazine within said bore so that each chamber in turn will be in alignment with said barrel of said pistol and said cartridges in turn will be in position to be pushed by said bolt and fired from said barrel, wherein each said chamber of said magazine comprises:

(d) at least one spring placed at bottom of said chamber;

(e) a follower placed on top of said spring with said cartridges sitting one on top of each other on said follower so that said spring and said follower can push said cartridges up, wherein said magazine further comprises:



(f) a rotating disc mounted on top of said magazine, said disc having a slot to allow passage of said cartridges to and from said chambers;

(g) an alignment pin mounted perpendicular to said disc opposite said slot so that said magazine can be placed in a proper position within said bore of said handle, wherein said means for revolving said magazine within said bore comprises:

(h) a loading rod mounted to top of said bore of said handle and extending downwardly;

(i) said magazine having a central longitudinal aperture so that said magazine can slide onto said loading rod;

(j) a knob affixed to bottom of said magazine so that said magazine can revolve around said loading rod within said bore.

4,619,064

MINIATURE FIREARM

Yves Stolz, Bourguillards 10, CH-2072 Saint-Blaise, Switzerland

PCT No. PCT/CH82/00059, § 371 Date Dec. 27, 1982, § 102(e) Date Dec. 27, 1982

Continuation of Ser. No. 456,025, Dec. 27, 1982, abandoned.

This PCT application Apr. 26, 1982, Ser. No. 763,085

Claims priority, application Switzerland, Apr. 25, 1981, 2720/81

Int. Cl.⁴ F41C *19/00, 3/00, 1/00*

U.S. Cl. 42—69.01 **7 Claims**

1. An operational miniature firearm approximately 4 to 5 centimeters in size comprising:

a gun body and butt;

a barrel attached to said body and having a bore caliber of about 2 millimeters;

a rimfire projectile cartridge holding means aligned with the bore of said barrel for holding a rimfire projectile cartridge with a projectile of suitable caliber for firing along said bore;

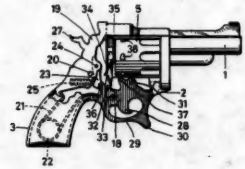
a hammer means pivotally mounted on said gun body to strike and thereby fire any such suitable caliber rimfire projectile cartridge held in said holding means;

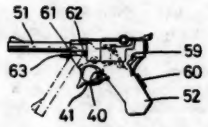
first spring means for biasing said hammer means towards said holding means;

a pawl pivotally mounted on said hammer means and having one end projectable away from said hammer means;

second spring means for biasing said pawl away from said hammer means; and

a sear pivotally mounted on said body and abuttable against said pawl, such that when said sear is pulled towards said gun butt it first pushes said hammer means upwards through said pawl, thereby to cock said hammer means, and then releases said hammer means by passing beyond said pawl, whereupon said first spring means causes said hammer means to strike and fire any such suitable caliber rimfire projectile cartridge in said cartridge holding means;





wherein said sear has an opening formed therethrough in a portion thereof substantially external to said gun body and butt when said sear is in a rest position, edges of said opening away from said gun body and butt being defined by a thin border portion of said sear having the shape of a trigger guard, and wherein said sear further has a protruding portion having the shape of a trigger and extending into said opening on a side thereof closest to said gun body.

4,619,065

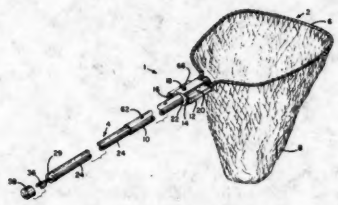
COMBINATION FISHNET AND FISHHOOK RETRIEVER

Stephen S. Jones, 1761 Carlos Dr., Las Vegas, Nev. 89123

Filed Oct. 22, 1984, Ser. No. 663,399

Int. Cl.[4] A01K *77/00*

U.S. Cl. 43—11 **8 Claims**



1. A combination fishing net and snagged-hook retriever comprising

a fishing net mounted on a frame,

an elongated hollow tubular handle operatively connected to the frame,

an elongated handle extension member telescopically mounted within the handle, being movable between a retracted position fully enclosed within the handle and an extended position in which only a portion of the extension member remains within the handle,

hook-retrieving means mounted on an end portion of the extension member and having a maximum diameter not exceeding the diameter of the extension member such that when the extension member is retracted, the hook-retrieving means is entirely enclosed within the tubular handle, and stop means for releasably locking the extension member in a retracted or extended position,

the hook-retrieving means comprising a ring member formed by a pair of arms, and a slot in the ring member permitting access of a fishing line therethrough.

4,619,066

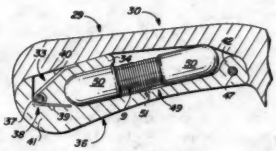
FLOAT RELEASE DEVICES

Donald R. Kirkland, 1029 Edgewood Dr., Jacksonville, Tex. 75766, and Paul J. Morcom, Rte. 3, Box 1088, Troop, Tex. 75789

Continuation-in-part of Ser. No. 652,112, Sep. 19, 1984. This application Jan. 30, 1985, Ser. No. 696,263

Int. Cl.[4] A01K *47/00, 87/00*

U.S. Cl. 43—25 **14 Claims**



1. A float release device in combination with a fishing rod handle for locating and retrieving a submerged fishing rod, said handle having an opening or cavity provided therein, said combination comprising lever means pivotally carried by the rod handle and substantially closing the cavity when in closed configuration; bias means biasing said lever means in open configuration; flotation means located in the cavity; and release means cooperating with said lever means and the rod handle to close said lever means against the bias of said bias means, said lever means including pocket means pivotal therewith for loosely retaining said flotation means whereby said lever means opens by operation of said bias means and said flotation means exits the cavity responsive to operation of said release means when the object is submerged.

4,619,067

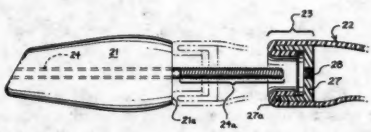
FISHING LURE ASSEMBLY

Robert A. West, 76-6294 Kupuna St., Kailua-Kona, Hi. 96740

Filed Apr. 18, 1985, Ser. No. 724,356

Int. Cl.[4] A01K *85/00*

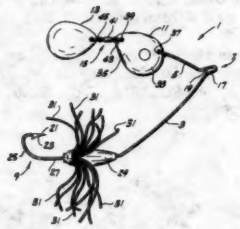
U.S. Cl. 43—42.09 **3 Claims**



1. A fishing lure assembly comprising a head portion, an elongate tube embedded in said head portion, the trailing end of said tube extending rearwardly from said head portion, said trailing end being threaded, a rigid cup having a threaded portion for threadedly engaging the threaded trailing end of said tube, a decorative shirt for attracting fish thereto formed at its leading end with a resilient tubular portion surrounding

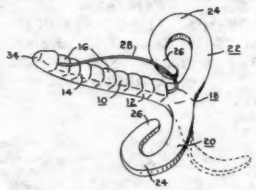
the cup and folded rearwardly into same to lie across the edge of said cup, that part of said tubular skirt portion lying across the edge of said cup being disposed to be pinched between the rear of said head portion and the edge of said cup to retain said skirt to said head in response to screwing said cup along the threaded trailing end of said tube until the cup and head tightly grip said resilient tubular portion therebetween.

4,619,068
FISHING LURE
Fred W. Wotawa, 4646 Heege Rd., Affton, Mo. 63123
Filed Aug. 2, 1984, Ser. No. 637,075
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.11 **8 Claims**



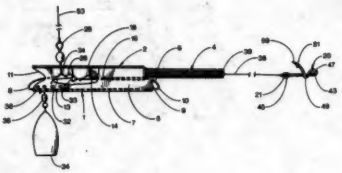
1. A fishing lure comprising first and second diverging arms, means adjacent the juncture of said arms for attaching the lure to a fishing line, a hook connected to the first arm, a vane connected to the second arm to permit oscillating movement of the vane relative to the second arm, a spinner and means swivelly connecting said spinner directly to said vane, said vane being generally pear-shaped, having a relatively broad front portion connected to said second arm, and a narrower rear portion, said spinner being generally pear shaped having a relatively broad rear portion and narrower front portion swivelly connected at said narrower front portion to the narrower rear portion of said vane.

4,619,069
DOUBLE TAILED FISH BAIT
Richard C. Strickland, P.O. Box 1136, LaBelle, Fla. 33935
Filed Nov. 21, 1984, Ser. No. 673,670
Int. Cl.[4] A01K *85/00*
U.S. Cl. 43—42.26 **2 Claims**



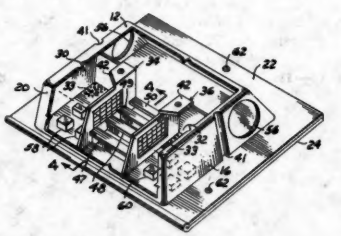
1. A fish bait comprising a plastic lure having an elongated body section having forwardly and rearwardly disposed ends, symmetrically disposed oppositely extending substantially flat surfaced leg members aligned with each other and extending in opposite directions at substantially right angles relative to the elongated body section from a point at the rear end of the body section, the oppositely extending leg members being symmetrical and being a mirror image of each other and having uninterrupted successively spaced outwardly, forwardly, inwardly and rearwardly extending curved sections of progressively decreasing cross section in both thickness and width to induce the terminal ends of each of the leg members to deflect in varying directions as the bait is projected through the water.

4,619,070
FISHING PLANER LINE PROTECTOR
Fred C. Jung, 3411 East 52nd Avenue, Vancouver, British Columbia, Canada (V5S 1V6)
Filed Nov. 18, 1985, Ser. No. 799,356
Int. Cl.[4] A01K *95/00*
U.S. Cl. 43—43.13 **15 Claims**



1. A fishing device comprising: a body with a flat planing surface; bail means for slidably receiving a connector at an end of a fishing line, the bail means having a first position for the connector where the planing surface is angled to carry the fishing line to a desired depth below a body of water and a second position assumed by the connector when a fish strikes where the planing surface is angled to move the device towards the surface of the water as the fishing line is reeled in; a tubular line protector for slidably embracing a leader; means for releasably connecting the line protector to the body; and means for engaging the line protector with the leader so the line protector is disconnected from the body when a fish pulls on the leader and for disengaging the line protector for slidable movement along the leader after the line protector is disconnected from the body.

4,619,071
RODENT BAIT STATION
Donald W. Willis, P.O. Box 291, Lompoc, Calif. 93436
Filed Feb. 8, 1985, Ser. No. 699,895
Int. Cl.[4] A01M *25/00*
U.S. Cl. 43—131 **1 Claim**



1. A rodent bait station, comprising:
a housing formed from light weight semi-flexible plastic,
said housing having a flat top wall and parallel generally rectangular depending side, front and rear end walls with an outstanding flange formed on the lower edge of the respective depending wall;
a flat sheet forming a housing bottom wall hingedly secured to the outer limit of the flange on the rear end wall and adapted to be bonded to the outstanding flange of the respective walls,
said side walls each having a rodent entry hole formed therein adjacent said front end wall in approximately axial aligned relation;

a pair of bait retainers disposed in spaced-apart relation in said housing adjacent said rear wall and the respective side wall to define an open rodent compartment between the bait retainers,

each bait retainer of said pair of bait retainers including a front panel and a side panel joined together at one end in substantially right angular relation respectively parallel with the housing front wall and housing side walls and extending between the housing top and bottom walls and contacting at their respective other ends the respective housing side wall and the housing rear end wall,

each retainer side panel having a window facing in spaced-apart relation the window in the other side panel providing rodent access to contained bait;

rail means including a plurality of rails, T-shaped in transverse section, extending in parallel spaced-apart relation between said bait retainer side panels for normally preventing movement of bait from said bait retainers toward said housing front wall; and,

bait retainer anchor means including a vertically apertured gusset extending horizontally between and rigidly joining each said bait retainer front panel with the respective said bait retainer side panel and anchor pins depending from said housing top wall and projecting into the respective gusset aperture for preventing movement of said pair of bait retainers relative to said housing.

4,619,072

METHOD AND APPARATUS FOR IRRIGATING PLANTS

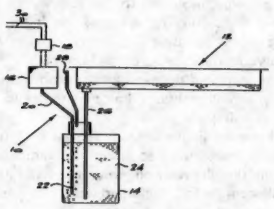
Eric B. Privett, P.O. Box 106, Honeydew 2040, South Africa

Filed Sep. 6, 1984, Ser. No. 647,935

Claims priority, application South Africa, Sep. 9, 1983, 83/6699

Int. Cl.[4] A01G *31/02*

U.S. Cl. 47—59 **8 Claims**



1. A method of irrigating plants in a controlled manner including the steps of moving liquid from a reservoir to a container accommodating the plants and situated a predetermined distance above the reservoir by introducing a flow of air under pressure into the reservoir through an air supply conduit extending into the reservoir to a level beneath the surface of the liquid therein and near to the bottom of the reservoir to displace liquid from the reservoir to the container and to aerate the liquid which is so displaced, constantly venting air to atmosphere from above the liquid in the reservoir through a vent controlled by a variable aperture nozzle, limiting the liquid level in the container at a desired level for efficient plant growth by an appropriate setting of the variable aperture nozzle, periodically terminating the flow of air into the reservoir to permit excess liquid to return from the container to the reservoir under gravity while permitting air to evacuate from the reservoir to atmosphere through the vent and regulating the introduction and termination of the air flow in accordance with a predetermined cycle.

5. An apparatus for irrigating plants in a controlled manner including a reservoir for containing irrigating liquid and for location at a predetermined level below that of a container which accommodates plants which are to be irrigated, a vent which includes a variable aperture nozzle and which provides continuous communication between an air space above the liquid in the reservoir and the atmosphere, air supply means operable to supply a flow of pressurized air, an air supply conduit extending from the air supply means and into the reservoir where it vents at a position beneath the surface of the liquid therein and near the bottom thereof, the air supply conduit serving to convey pressurized air into the reservoir to displace liquid from the reservoir to the container, the displaced liquid being aerated by virtue of the fact that the air vents into the reservoir beneath the surface of liquid therein and near the bottom thereof and bubbles up through the liquid, level control means for limiting the liquid level in the container at a desired level for efficient plant growth, said control means being constituted by a combination of the variable aperture nozzle in the vent and the air supply conduit which vents beneath the surface of the liquid in the reservoir, and regulating means periodically for terminating the operation of the air supply means in accordance with a predetermined cycle to permit excess liquid to return to the reservoir from the container under gravity, the vent serving to permit escape of air from the reservoir to atmosphere both during displacement of liquid from the reservoir to the container and during return of liquid from the container to the reservoir, and to control the rate of such return flow.

4,619,073

ADJUSTABLE SHUTTER ASSEMBLY AND METHOD OF MAKING THE SAME

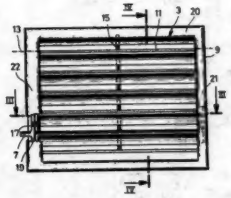
Ingo W. Janthur, Berlinger; Alfred Roth, Undenheim, and Stefan Odry, Darmstadt, all of Fed. Rep. of Germany, assignors to General Motors Corporation, Detroit, Mich.

Filed May 30, 1985, Ser. No. 739,582

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420419

Int. Cl.[4] E05F *17/00*

U.S. Cl. 49—74 **6 Claims**



1. In an adjustable shutter assembly comprised of a plurality of shutter blades adapted for pivotal movement about parallel pivot axes, said shutter blades being articulated to a common actuating rod extending along one end of all the blades so as to effect adjustment of the blades, the improvement comprising:

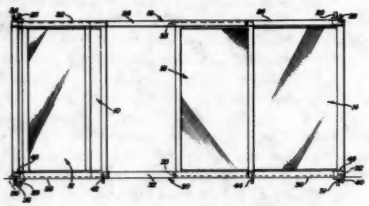
the shutter blades being combined with an auxiliary frame so as to form a unitary structure therewith and being connected with ribs of the auxiliary frame by way of living-type hinges and forming a unitary structure with the actuating rod by way of respective further living-type hinges at said one end of the blades extending transverse to the first-mentioned hinges and joined to the respective one end of the blades by a portion extending laterally from each said one end.

4,619,074

CONVERTIBLE DOOR SYSTEM

Ignatius Y. P. Leung, 8881-A Fontainbleau Blvd., Apt. 501, Miami, Fla. 33172, and Adolfo A. Diaz, 20210 SW. 114th Ct., Miami, Fla. 33157

Filed Aug. 12, 1985, Ser. No. 764,756
Int. Cl.[4] E05D *15/00*
U.S. Cl. 49—143 10 Claims



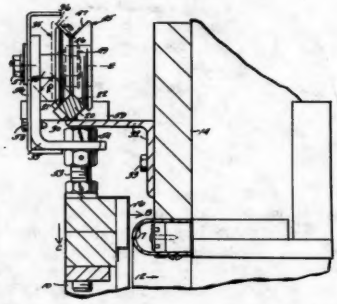
1. A closure structure, namely one of a door and window structure, for receipt in an opening in a building wall and the like comprising at least one pair of cooperative panels including a first panel having means for mounting same in the opening for swinging open and closed, and a second panel for sliding relative to the first panel between a fully closed position of the structure in which the panels are located substantially end-to-end, and a semi-opened position of the structure in which the panels are juxtaposed face-to-face, the structure further including track means on which the second panel slides between said positions, the track means including a first pivoted section juxtaposed the first panel for swinging movements sustantially in parellel therewith, and a second section for fixing in the opening end-to-end with the first section whereby the second panel can be slid along the track means between the respective sections thereof and when fully received in the first section can be swung open as a unit with the first section so as to provide substantially unobstructed access across the full width of the opening.

4,619,075

HORIZONTAL SLIDING DOOR

Vernon L. Wiles, Williamsport, Md., assignor to Jamison Door Company, Hagerstown, Md.

Filed Sep. 19, 1984, Ser. No. 652,091
Int. Cl.[4] E05D *15/56*
U.S. Cl. 49—235 19 Claims



1. A sliding door assembly for closing an opening in a wall having a width W, comprising:

a door having a predetermined width;

means for mounting said door for sliding movement over a majority of the length of travel thereof in a first direction, and additionally for movement in second and third directions adjacent the end of travel thereof in said first direction, said second and third directions each being generally perpendicular to said first direction, and perpendicular to each other;

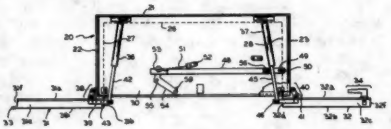
said mounting means including track means and a first and a second roller spaced from each other in said first direction a distance less than W, said first roller comprises a first V-shaped roller having asymmetrical first and second surface lengths, and wherein said second roller comprises a second V-shaped roller with asymmetrical first and second surface means; the asymmetry of said second roller being opposite the asymmetry of said first roller.

4,619,076

SAFETY CABINET LATCHING SYSTEM

Jerry L. Livingston, Humboldt, Ill., assignor to Justrite Manufacturing Company, Mattoon, Ill.

Filed Apr. 15, 1985, Ser. No. 723,337
Int. Cl.[4] E05C *7/05*
U.S. Cl. 49—367 4 Claims



1. In a closure mechanism for a cabinet, said cabinet of the type where said closure mechanism is adapted to close off said cabinet front,

said closure mechanism comprising:

a pair of rotating doors called a first door and a second door,

closing means to urge said first and second doors to a closed position,

a timing means mounted to the interior of the cabinet to control the closing sequence of the doors,

latching means to latch said doors in a closed position responsive to the closing of said doors;

means to prop said doors in an open position,

said prop means including link means pivotally mounted to each said door,

said link means being fashioned from heat fusible material whereby a selected rise in ambient temperature will fuse said link thereby releasing said door from its open position and allowing it to close when said timing means releases it for rotation to a closed position,

the improvement comprising a latch assembly with a latching rod that includes an inclined outer end which forms an acute angle with an inner portion of said latching rod, said latching rod being spring biased outwardly to urge said inclined outer end out of an opening in one of the doors into engagement with the cabinet by having the outer inclined end protrude through an opening in the wall of the cabinet.

4,619,077

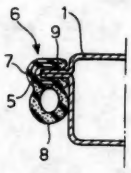
WEATHER STRIP FOR MOTOR VEHICLE BODIES AND AN EXTRUSION HEAD FOR MAKING THE STRIP

Roberto Azzola, Turin, and Luciano Carrera, Cirié, both of Italy, assignors to S.A.I.A.G. S.p.A., Turin, Italy

Filed Jan. 6, 1984, Ser. No. 568,565
Claims priority, application Italy, Jan. 6, 1983, 67008 A/83
Int. Cl.[4] E06B *7/16*
U.S. Cl. 49—497 2 Claims

1. Weather strip adapted for securement to the edge of an opening or the edge of a closure element closing the opening in the body of a motor vehicle wherein the edge is comprised of successive, substantially straight portions connected by corner portions having small radii of curvature, the weather strip including an anchoring section of elastomeric material to

which a tubular sealing section also of elastomeric material is connected, and comprising first and second longitudinal portions for connection to the substantially straight portions and to the corner portions of the edge, respectively; the wall of the



tubular sealing section having a greater thickness in the second longitudinal portions than the first longitudinal portions, the increase in thickness being achieved during extrusion of the weather strip.

4,619,078

GRINDING MACHINE WITH PROTECTIVE HOOD FOR THE GRINDING WHEEL

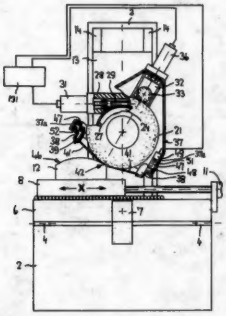
Uwe Uhlig, Buchholz, Fed. Rep. of Germany, assignor to Hauni-Werke Körber & Co. KG., Hamburg, Fed. Rep. of Germany

Filed Jun. 20, 1984, Ser. No. 622,709

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1983, 3323424

Int. Cl.[4] B24B *7/00*

U.S. Cl. 51—5 D **15 Claims**



1. A grinding machine, comprising a frame; a work holder on said frame; a rotary spindle for at least one grinding wheel on said frame; drive means for effecting relative movement between said spindle and said holder so as to enable a wheel on said spindle to carry out a grinding operation upon the workpiece on said holder; a protective hood provided on said frame and arranged to partially surround the grinding wheel on said spindle; and means for automatically changing the position of said hood relative to said frame in dependency on the configuration of the workpiece on said holder while the grinding wheel on said spindle removes material from such workpiece and the workpiece is out of contact with the hood.

4,619,079

GRINDING MACHINE FOR BALL END MILLS WITH HELICAL CUTTER TEETH

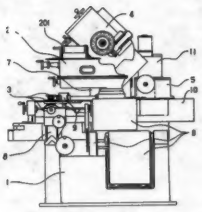
Morio Kidani, Kopo Tasaka 304, 8-14, Misasamachi 2-chome, Nishi-ku, Hiroshima-shi, Hiroshima-ken 730,, Japan

Filed Mar. 29, 1985, Ser. No. 717,788

Claims priority, application Japan, Mar. 31, 1984, 59-64218

Int. Cl.[4] B24B *3/08*

U.S. Cl. 51—165.71 **4 Claims**



1. A grinding machine for grinding cutter teeth on a ball and mill, comprising:

a machine base;

a Y-direction slide table disposed over said machine base and movable back and forth thereon;

an X-direction slide table disposed over the Y-direction slide table and movable right and left thereon;

a proportional guideway fixed on the Y-direction slide table and being freely rotatable about a perpendicular axis;

a spindle and a turntable having means for turning the spindle through an angle α of turning movement having a reference position in which the spindle extends parallel to an X-axis, in a pattern of tan $\gamma \cdot F(\alpha)$ where γ is the helix angle of helical cutter teeth to be ground on the ball end mill, the turntable including a turntable base fixedly mounted on the X-direction slide table, swivel base box means rotatably mounted on and projecting sidewardly of the turntable base, the spindle being disposed over the sidewardly projecting swivel base box means for mounting a workpiece, and a F (α) cam means disposed in the swivel base box means;

a grinding wheel mechanism tiltable laterally about a Y axis and having grinding wheel shafts for alternatively supporting face and flank grinding wheels and means for moving the grinding wheel shafts to enable the tip end of a cutter tooth being generated on said ball end mill to lie in a prescribed point on the Y-axis at all times, the mechanism as a whole being tiltable dependent on the turning movement of the turntable in a pattern of tan $\gamma \cdot F'(\alpha) \cdot \cos \alpha$ so as to enable the face grinding wheel to have its grinding surface geometrically contact the curved surface of a spherical cutter tooth at the cutting edge thereof in a prescribed point on the Y-axis, and also enable the flank grinding wheel to contact the curved cutting edge of the spherical cutter tooth in a constant relationship at all times dependent on the shape of the flank;

a first mechanism disposed over the machine base and to the rear of the Y-direction slide table for calculating the angle of inclination of the grinding wheel mechanism at the time of grinding tapered helical cutter teeth with a constant lead;

a bearing box disposed over the first mechanism and to the rear of the swivel base box means, the face grinding wheel shaft having an axis in the Y-axis direction and the flank grinding wheel shaft having an axis in the X-axis direction respectively disposed in front of the bearing box and rotatable and adjustable vertically at about an axis parallel to the X-axis;

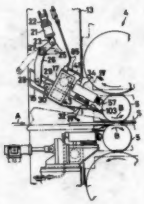
a second mechanism arranged over the bearing box and disposed over the first mechanism for calculating the angle of inclination of the grinding wheel mechanism.

4,619,080

ROLL GRINDING APPARATUS FOR ROLLING MILLS

Yoshiyuki Okamoto; Kazuhiko Sato, both of Himeji; Shunji Uryu, Kitakyushu, and Kiyoshi Morita, Himeji, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,847
Claims priority, application Japan, Mar. 5, 1984, 59-40443
Int. Cl.[4] B24B *19/00*
U.S. Cl. 51—251 10 Claims



10. A roll grinding apparatus for use on a rolling mill which comprises:

a housing adapted to be positioned adjacent a roll having a roll axis;

a frame guide disposed on said housing and having at least one guide surface which extends in a direction which is perpendicular to said roll axis;

a frame movably mounted along said at least one guide surface of said frame guide;

means for moving said frame towards and away from said roll axis;

a casing guide disposed on said frame and extending in a direction perpendicular to said at least one guide surface of said frame guide;

a casing movably mounted on said casing guide, said casing having a plurality of guide holes facing said roll axis;

means for moving said casing reciprocatively along said casing guide;

a plurality of grindstone holders, each of said grindstone holders slidably disposed in a respective guide hole;

a plurality of grindstones, each of said grindstones disposed on a respective grindstone holder, said grindstones facing said roll axis, said grindstone holders including grindstone stoppers mounted thereon, each of said grindstone stoppers comprising a rod movably supported at one end thereof by a respective grindstone holder, a cam mechanism attached to a free end of said rod and an arm having a pawl which is engageable with a respective grindstone, said arm being connected to said cam mechanism for pvioting said pawl into and out of engagement with said resepctive grindstone; and

means for independently reciprocating each of said grindstone holders towards and away from said roll axis, said grindstone holder reciprocation means including hydraulic cylinder means attached to each to said grindstone holders for selectively moving an individual grindstone towards and away from a roll to be ground.

4,619,081

COMBINED NOZZLE WITH AIR FOIL

Scott J. Lipanski, Fremont, Calif., assignor to General Signal Corporation, Stamford, Conn.

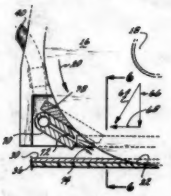
Filed Feb. 28, 1985, Ser. No. 706,620
Int. Cl.[4] B24B *55/02*
U.S. Cl. 51—267 16 Claims

1. A combined nozzle and air foil for providing a flow of cooling and cleaning fluid to a rotating cutting blade providing cutting of a substrate, including,

a nozzle portion for location intermediate the cutting blade and the substrate at a position adjacent the substrate,

the nozzle portion including at least one opening for directing a flow of cooling and cleaning fluid to the blade and to the cut area of the substrate,

an elongated air foil portion mounted above and extending from the nozzle portion to be cut by the cutting blade to form an air foil on both sides of the cutting blade and with the air foil producing a partial vacuum below the air foil and adjacent the opening in the nozzle to provide an efficient flow of the fluid to the blade and the cut area of the substrate,



the air foil portion including shaped surfaces on both sides of the cutting blade and with the top leading edges of the air foil smaller in cross section than the bottom trailing edges of the air foil, and

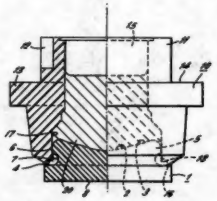
means for movably mounting the combined nozzle and air foil portions for providing movement of the combined nozzle and air foil to have the air foil engage the cutting blade to custom cut the air foil to match the dimensions of the cutting blade and to provide the proper location of the nozzle to direct the flow of the fluid.

4,619,082

METHOD OF MANUFACTURING A CONTACT LENS

Michael J. Dent, Chalfont St Giles, and Ian L. Handricks, Chalgrove, both of England, assignors to Contact Lens Supplies Limited, England

Filed Oct. 23, 1984, Ser. No. 663,780
Claims priority, application United Kingdom, Oct. 24, 1983, 8328365
Int. Cl.[4] B24B *1/00*
U.S. Cl. 51—284 R 2 Claims



1. A method of manufacturing a contact lens comprising the steps of:

forming a blank in the shape of a right circular cylinder to produce thereon a first lens face facing in a first direction, an annular reference surface on said blank facing said first direction, said blank having an area of reduced diameter intermediate said first lens face and said reference surface, said reference surface being spaced by said reduced diameter area from said first lens face;

mounting said reduced diameter area of said blank within an opening of a work holder, said work holder having an outer annular rim for engaging said reference surface of said blank;

positioning said first lens face of said blank within said opening, the opposite end surface of said blank being exposed;

introducing molten securing material into said work holder

and into contact with said first lens face of said blank, said molten material cooling and setting, thereby securing said blank to said work holder;

mounting the work holder on a machine tool such that the work holder holds the blank with said work holder and said first lens face accurately positioned relative to said machine tool;

machining the blank to form thereon a second lens face and concurrently removing all unwanted blank material to leave only the finished contact lens held in the work holder by the securing material; and

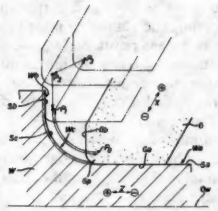
releasing the finished contact lens from said securing material.

4,619,083

GRINDING METHOD OF ROUNDED ANNULAR CORNER ON WORKPIECE

Hitoshi Akabane, Anjoh, and Gen Ishiyama, Kariya, both of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 15, 1985, Ser. No. 712,093
Claims priority, application Japan, Mar. 19, 1984, 59-52680
Int. Cl.⁴ B24B *1/00*
U.S. Cl. 51—289 R **3 Claims**



1. A method of grinding a rounded annular corner formed between cylindrical and shoulder portions of a workpiece, the method comprising the steps of:

rotating the workpiece about a first axis coinciding with the longitudinal axis thereof;

providing a grinding wheel having cylindrical and shoulder grinding surfaces for respectively grinding the cylindrical and shoulder portions of the workpiece, said grinding wheel also having apex portion formed between the cylindrical and shoulder grinding surfaces for grinding the rounded annular corner of the workpiece;

rotating said grinding wheel about a second axis extending across the first axis;

positioning said grinding wheel at a starting point where said grinding wheel is in contact at the cylindrical grinding surface with the workpiece cylindrical portion and at the shoulder grinding surface with one end of the rounded annular corner adjacent to the workpiece cylindrical portion;

effecting first relative movement between the rotating grinding wheel and the rotating workpiece for moving the apex portion of the grinding wheel along the rounded annular corner from the starting point to a terminal point where the workpiece shoulder portion is ground by the shoulder grinding surface of said grinding wheel;

effecting second relative movement between the rotating grinding wheel and the rotating workpiece for retracting said grinding wheel radially outwardly of the workpiece from the terminal point to an escape point where the shoulder grinding surface is out of contact with the workpiece shoulder portion;

effecting third relative movement between the rotating grinding wheel and the rotating workpiece for returning said grinding wheel from the escape point to the terminal point; and

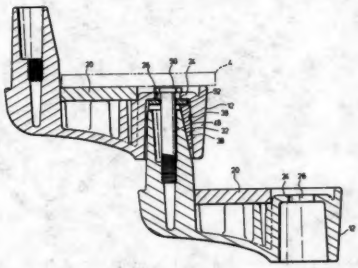
effecting fourth relative movement between the rotating grinding wheel and the rotating workpiece for moving the apex portion of the grinding wheel from the terminal point to the starting point along the rounded annular corner of the workpiece.

4,619,084

ARTICULATING, SELF-SUPPORTING STAIRCASE

Bernard H. Snitman, 21 Tyrrel Avenue, Toronto, Ontario, Canada (M6G 2G1)

Filed Jan. 28, 1985, Ser. No. 695,825
Int. Cl.⁴ E04F *11/00*
U.S. Cl. 52—182 **13 Claims**



11. An articulating, self-supporting staircase which comprises a plurality of individual, interconnected and locked elements, each element having a tread and a riser, and a wedge locking means locking said interconnected elements firmly together, wherein each tread is secured to the top of each riser by means of a plurality of screws, each screw extending upwardly through a boss in said riser, into said tread; each riser except for the top riser comprising a base and a conical protrusion extending upwardly from the rear of said base, said base having a plurality of strengthening ribs therein, and a strengthening box therein which is enclosed by a plate, said base having a tapering hole on the undersurface at the front thereof wherein the protrusion of the lower adjacent element is inserted and locked, each protrusion having three longitudinally slotted flattened sides; said wedge locking means comprising three longitudinally ribbed wedges, each wedge over one of said flattened sides of said protrusions, a retaining ring retaining said wedges on said flattened sides, and a threaded bolt inserted through said hole and into the protrusion of the riser to interconnect said adjacent risers, and a washer on said bolt above said wedges on the top of said protrusions; whereby when said bolt is tightened, said washer drives said wedges downwardly and firmly interconnects adjacent risers.

4,619,085

GRAIN BIN FLOOR AND METHOD OF MAKING SAME

Michael W. Carroll, Roselle, and Michael E. Harwood, Palatine, both of Ill., assignors to North American Agricultural, Inc., Schaumburg, Ill.

Filed Feb. 15, 1984, Ser. No. 580,464
Int. Cl.⁴ E04H *7/00*
U.S. Cl. 52—192 **8 Claims**

1. A grain floor for storing grain and for supporting the grain above a base which may be uneven at certain locations, said floor comprising

a plurality of corrugated floor plates defining a substantially horizontal floor to receive grain thereon,

a plurality of beams extending horizontally and longitudinally beneath the floor plates supporting the floor plates and grain thereon, said beams being arranged in parallel rows and extending normal to the corrugations,

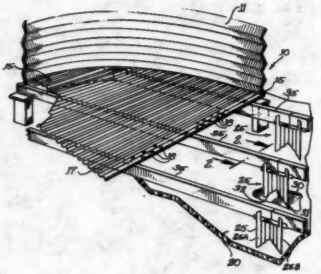
said beams being spaced laterally of each other,

a plurality of vertical metal columns disposed beneath the beams and supporting the beams at spaced locations along the length of the beams,

said columns being formed of sheet metal and having at least two vertical legs joined at angles to each other,

said beams being made of wood with a rectangular cross section having the longer dimension disposed vertically, said beams being made of a plurality of portions with the portions being aligned in a straight line, and

bearing means spanning the legs of said column and secured to said wooden beam to transfer load from the wooden



beam to the column, said bearing means being substantially shorter in length than the portions of the beams, said bearing means being made of metal and preventing the edges of the sheet metal legs from digging into said wooden beams and serving to distribute the load between the beams and the legs,

co-acting means on the bearing means and legs for rigidifying the legs against bending inward under loading from the grain, and

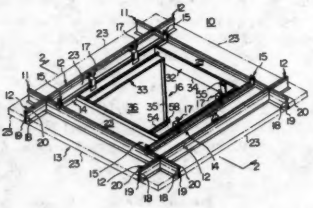
interlocking means on the beams and bearing means to hold the beams against turning and against separation from the bearing means.

4,619,086

CEILING CONSTRUCTION

Hiromitsu Naka, Yashio, Japan, assignor to Kabushiki Kaisha Naka Gijutsu Kenkyusho, Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,265
Claims priority, application Japan, Jul. 11, 1983, 57-127259
Int. Cl.[4] E04B 5/52
U.S. Cl. 52—205 **5 Claims**



1. A ceiling construction for buildings comprising:

a plurality of main beams disposed in a predetermined spaced relationship to each other and positioned for bridging wall moldings opposed and spaced from each other, said main beams including a web, a flange integrally formed with the lower end of the web, and a bulb integrally formed with the upper end of the web;

a plurality of cross beams connected to said main beams in a predetermined spaced relationship to each other at right angles to the main beams so as to form a ceiling framework, said cross beams including a web, a flange integrally formed with the lower end of the web, and a bulb integrally formed with the upper end of the web;

a ceiling wall mounted in said ceiling framework with the upper side of the ceiling wall above the flanges of said main and cross beams in said ceiling framework, said ceiling wall having an access opening therein in a predetermined position between a pair of spaced opposed main beams and a pair of spaced opposed cross beams extending between said pair of main beams;

a pair of auxiliary beams each positioned on the upper side of the ceiling wall and each bridging the flanges of one of a pair of opposed main beams adjacent to and spaced from each other and a pair of opposed cross beams adjacent to and spaced from each other, said auxiliary beams extending along the edges of said access opening;

a plurality of fastening means securing the opposite ends of said auxiliary beams to said pair of beams, said fastening means including a pressure plate engaging said auxiliary beam at the end of the auxiliary beam and pressing said auxiliary beam and the ceiling wall on which it rests against the flange of the corresponding beam of said pair of beams, a clamping plate having a hook for engaging the bulb on said corresponding beam of said pair of beams and engaged with said pressure plate and securing said pressure plate to the web of said corresponding beam, and a screw securing said claimping plate to said pressure plate;

an access door means positioned in said access opening and having a stationary frame having an outwardly extending flange, a movable frame hingedly connected to said stationary frame, and a cover plate fixedly secured to said movable frame; and

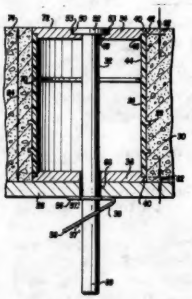
a plurality of mounting means securing said access door to said auxiliary beams with the outwardly extending flange of the stationary frame against the edge of the ceiling wall which defines said access opening.

4,619,087

BARRIER-EMBEDDED PIPE-COUPLING APPARATUS AND METHOD

Gerold Harbeke, 2807 S. Military Trail, West Palm Beach, Fla. 33415

Filed May 1, 1985, Ser. No. 729,495
Int. Cl.[4] E04G 5/48
U.S. Cl. 52—221 **1 Claim**



1. A combination support apparatus and concrete wall pipe coupling comprising:

an elongated, cylindrically-shaped, female/female pipe coupling to be embedded in a concrete barrier, said pipe coupling having an elongated tubular shape and having integral female pipe receiving elements at opposite ends thereof, said pipe coupling including an anchor protrusion on the outer surface thereof for preventing longitudinal movement of said pipe coupling in said concrete barrier;

a support apparatus for attaching the fluid-conveying pipe coupling to be embedded, in the concrete barrier to a wall of a concrete form while the concrete is being poured and cures, said support apparatus comprising:

an outer rigid disk for engaging an outer end of the fluid-conveying pipe coupling which is furtherest from said wall of said form;

an elongated compressing column attached to said outer disk for extending through said fluid conveying pipe coupling and through a hole in said wall of said form, said outer disk having a size for contacting an outer end of said pipe coupling and forcing it toward said form wall, said elongated compressing column having a length such that when it is pulled through said hole in said form so that said outer disk pulls said pipe coupling rigidly against said form wall a significant portion of said compressing column extends from the other side of the form wall; and,

a fastening means for attaching to said significant portion of said compressing column at any longitudinal position on the other side of said form wall for abutting against said other side and thereby holding said fluid conveying pipe coupling rigidly compressed in a fixed postion between said form wall and said disk during the pouring and curing of said concrete;

a special relatively-short, male/male expansion insert for coupling to one end of said female/female pipe coupling, said expansion insert having a tubular shape with internal and external wall surfaces, of fixed diameters, said fixed diameter of said external wall surface being such that either end of said special expansion pipe insert fits snugly into one end of said pipe-coupling, with the external wall surface at only one of said ends having at least one circumferential groove formed therein with an O-ring positioned in said groove for forming a seal with said pipe-coupling when said only one end of said expansion insert is inserted therein and for maintaining said seal as said only one of end of said expansion insert is moved longitudinally therein, said relatively short, expansion insert having a handgrip ridge mounted on the outer surface thereof to allow one to more easily grip said relatively short expansion-pipe insert;

whereby said support apparatus can be used to mount said elongated pipe coupling on a form to embed it in a building barrier and thereafter said special expansion insert can be used to attach the pipe coupling to an external rigidly positioned pipe.

4,619,088

STRESSED REINFORCING TENDON AND STRUCTURE INCLUDING SUCH A TENDON

Javier Ripoll Garcia-Mansilla, Madrid, Spain, assignor to Manufacturas De Acero Y Caucho S.A., Barcelona, Spain

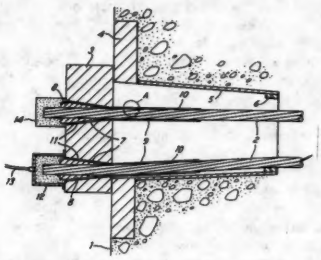
Filed Mar. 19, 1985, Ser. No. 713,604

Claims priority, application United Kingdom, Mar. 23, 1984, 8407596

Int. Cl.[4] E04C *3/10*

U.S. Cl. 52—223 L **8 Claims**

1. A stressed reinforcing tendon for a structure comprising at least one elongate element stressed over at least a portion of its length, an anchoring body in the form of a plate engaging said structure to transmit load thereto, a primary load transfer element in the form of an anchoring device anchoring said elongate element to said anchoring body by engaging the elongate element at one end of said stressed portion thereof so as to transmit stress in the elongate element from the elongate element to the anchoring body, and a second load transfer element in the form of a tube surrounding the stressed elongate element, said tube being secured at one end to the anchoring body and extending away from the anchoring body along said stressed portion of the eleongate element and being secured to the stressed portion of the elongate element at least at a region spaced from the anchoring body such that the tube transfers to the anchoring body part of the stress in the stressed elongate



element thereby relieving the primary load transfer element of part of the stress in the stressed elongate element.

4,619,089

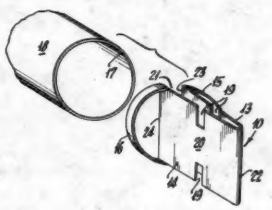
BUILDING STRUCTURE

Alejandro Stein, Residencias Sierra Nevada, Calle Chula Vista, Chula Vista Las Mercedes, Caracas, Venezuela

Continuation of Ser. No. 463,405, Feb. 7, 1983, abandoned. This application May 28, 1985, Ser. No. 738,491

Int. Cl.[4] E04B *1/10*

U.S. Cl. 52—233 **8 Claims**



1. An end connector adapted for insertion into an opening at one end of a hollow member, said connector presenting a general V-shape and providing two side panels, the side panels being joined at one end and open and separated at the other end, said side panels being resiliently movable upon pressure applied to the outside thereof to come together at said open end and upon release of pressure to separate from each other at said open end for ready insertion into said open end of said hollow member upon application of pressure to said side panels to bring said side panels together, the open end of each of said side panels being provided with means for engaging the inside of said hollow member when said connector is inserted within the opening of said end of said hollow member and the pressure released and each side panel of said connector being provided with a top notch and a bottom notch, said notches in each of said side panels being substantially the same size and in line, the notches in one of said side panels matching the notches in the other side panel of said connector.

4,619,090

TRUSS ASSEMBLY FOR BRICK WALL OR MASONRY SUPPORT

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07932

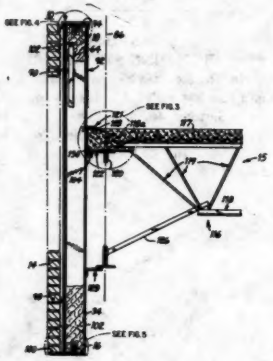
Filed Jul. 16, 1984, Ser. No. 631,179

Int. Cl.[4] E04B *1/30*

U.S. Cl. 52—235 **10 Claims**

7. A composite wall-floor system for a building comprising a truss assembly including:

a bottom chord;
a top chord;
a plurality of channel shaped vdrtical stud members, said vertical stud members spaced apart horizontally at standard construction dimensions, e.g. 2 feet on center;
a plurality of diagonals;
said stud members and diagonals each being connected at the top thereof to the top chord and connected at the bottom thereof to the bottom chord;
a lintel angle connected to at least the bottom of the vertical stud members, said lintel angle used for supporting a brick wall or other exterior facing from underneath;
means for fixedly securing the brick wall or exterior facing to the truss assembly;
respective pairs of top and bottom end connection means for connecting the top and bottom of said truss assembly to a pair of support columns; and,
truss-floor interconnecting means including a floor supporting stud member fixedly connected to and spanning said



truss assembly horizontally, a plurality of top connecting plate means designed to cooperatively engage between the floor system forming a part of the building, and the top of said floor supporting stud member, and bottom plate means designed to cooperatively engage between the floor system, including a supporting beam, and the bottom of said floor supporting stud member, whereby said floor supporting stud member serves as an edge form to contain concrete when poured to form the floor, said floor supporting stud member further including extending members which engage the concrete, and when it hardens, provides a secure lateral tie between the truss and floor, and whereby said bottom plate means acts to minimize concrete spillage when the concrete slab layer is poured, said composite wall-floor system further comprising a concrete floor system including, a poured concrete slab layer, underhanging chord assembly and joist webbing, said joist webbing fixedly interconnecting said chord assembly to said concrete slab layer.

4,619,091

CURTAIN WALL CONSTRUCTION HAVING PANEL SUPPORT DEVICE

Karl Gartner, Gundelfingen, Fed. Rep. of Germany, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Jul. 25, 1983, Ser. No. 517,008

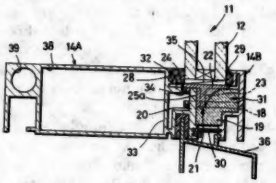
Claims priority, application Japan, Aug. 2, 1982, 57-117546[U]

Int. Cl.⁴ E04B *2/00*

U.S. Cl. 52—235 **1 Claim**

1. In a curtain wall construction, a heavyweight panel having (1) an exterior frame and (2) an interior frame connected together, (3) each of said frames including a pair of upper and lower horizontal frame members and a pair of vertical side frame members connected to said horizontal frame members at their ends, (4) said lower horizontal frame member of said interior frame having a vertical plate facing said exterior frame, and a horizontal plate with at least one opening, said horizontal plate being directed toward said exterior frame, the improvement of a support device in combination therewith, said device comprising:

(a) a horizontal support plate supporting said exterior and said interior frames at said lower horizontal frame members;



(b) a vertical plate projecting downwardly and substantially centrally from said horizontal support plate and disposed against said first-named vertical plate of said interior frame; and

(c) at least one vertical projection disposed on said horizontal support plate adjacent to an interior edge thereof and extending into said opening in said lower horizontal frame member of said interior frame, said projection comprising a downwardly directed solid cylinder.

4,619,092

CURTAIN WALL PANEL SUPPORTING DEVICE

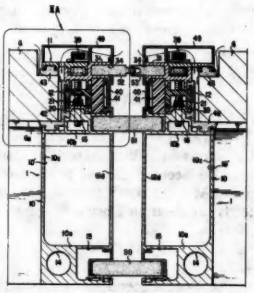
Hiromitsu Kaminaga, Kurobe, Japan, assignor to Yoshida Kogyo K. K., Tokyo, Japan

Filed Mar. 14, 1985, Ser. No. 711,831

Claims priority, application Japan, Mar. 22, 1984, 59-39961[U]

Int. Cl.⁴ E04B *7/14*

U.S. Cl. 52—235 **3 Claims**



1. A curtain wall panel supporting device comprising:

(a) a rectangular frame formed by right and left vertical frame members of a curtain wall unit having opposed inner and outer sides, upper and lower horizontal frame members of the curtain wall unit, connecting members having a heat insulating property and fixedly secured to the outer side of said vertical and horizontal frame members, and batten members fixedly secured to the outer side of said connection members;

(b) a panel mounted into said rectangular frame; and

(c) seal members provided between said rectangular frame and said panel,

wherein said batten members are connected to respective one outer side faces of said vertical and horizontal frame members through said connection members, and said rectangular frame has concave grooves which are contiguous along the four inner peripheries of the rectangular frame and which are open in vertical and transverse directions with respect to the curtain wall plane, and said panel is grippingly supported in said concave grooves through said seal members to form spaces between the panel and the concave grooves which spaces are contiguous along the four inner peripheries of the rectangular frame and are open to the outside air, and wherein the portions of said connection members which face said concave grooves are covered with said seal members, said seal members having heat insulating and water-tightness properties for portecting the integrity of the heat insulating property of said connection members.

4,619,093

DECORATIVE MATERIAL FOR WALLS OF BUILDINGS

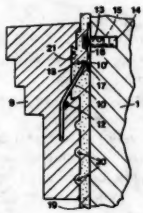
Jean-Paul Gandillon, 26 rue de Montbrillant, CH 1201 Geneva, Switzerland

Filed Mar. 31, 1983, Ser. No. 480,838

Claims priority, application Switzerland, Apr. 2, 1982, 2057/82

Int. Cl.[4] B44F *7/00*

U.S. Cl. 52—311 **3 Claims**



1. Material for decorative reliefs on walls of buildings, comprising in combination, an assortment of prefabricated decorative elements (3, 4, 5, 3', 4', 5', 6, 7, 7') made of stone, each possessing a flat surface which is placed against a surface of adhesive mortar which is inserted between each of said elements and a wall (1) of a building, each of said elements having at least one engaging device (10, 10') accessible from said flat surface, supporting devices (13) each presenting a first means (14) anchoring said device in said wall (1) of said building to abut against said wall, and second means (15, 16, 17, 18) arranged so as to be adjustable vertically and horizontally on the said first means (14) and shaped so as to co-operate with the engaging devices (10, 10') of the decorative elements, said engaging devices (10, 10') being interlocked with said supporting devices (13) previously anchored in said wall of said building so that said wall supports the weight of said decorative elements and maintains said decorative elements in position against said wall of said building, said first and second means being completely concealed between the decorative elements applied to a facade and the facade itself.

4,619,094

NON-PENETRATING MECHANICAL FASTENER FOR ROOFING MEMBRANE AND METHOD OF APPLYING SAME

James H. C. Yang, Cleveland, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed Dec. 11, 1985, Ser. No. 807,632

Int. Cl.[4] E04D *1/34, 5/14*

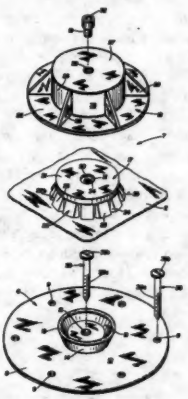
U.S. Cl. 52—410 **22 Claims**

1. A mechanical fastener for securing a flexible elastomeric sheet to the upper surface of a roof; said fastener including:

(a) a base plate formed with an upwardly extending projection adapted to be secured to the upper surface of the roof and underlie the elastomeric sheet;

(b) anchoring means for securing the base plate to the upper surface of the roof;

(c) resilient retainer means mounted on the base plate projection for engaging the elastomeric sheet located between said retainer means and projection;



(d) cap means mounted on the retainer means by a force-fit engagement with the retainer means for placing and maintaining the retainer means in a compressed state for clamping the elastomeric sheet between said retainer means and projection; and

(e) locking means for locking the cap means on the retainer means to maintain the elastomeric sheet in clamped engagement between the base plate projection and retainer means.

4,619,095

REVERSIBLE PANEL ARRANGEMENT

Kenneth A. Johnston, Mitcham, Australia, assignor to Kenross Nominees Proprietary Limited, Victoria, Australia

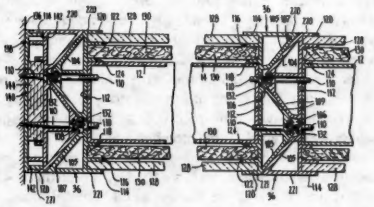
PCT No. PCT/AU80/00074, § 371 Date May 28, 1981, § 102(e) Date May 28, 1981, PCT Pub. No. WO81/01027, PCT Pub. Date Apr. 16, 1981

Continuation of Ser. No. 620,544, Jun. 18, 1984, abandoned, which is a division of Ser. No. 269,045, May 28, 1981, abandoned. This PCT application Oct. 2, 1980, Ser. No. 810,541

Claims priority, application Australia, Oct. 2, 1979, PE0732; Apr. 1, 1980, PE3150; May 8, 1980, PE3466

Int. Cl.[4] E04C *1/0*

U.S. Cl. 52—595 **15 Claims**



1. A panel comprising a frame having first and second side walls formed parallel to one another and defining a space therebetween, and an edge member secured to said frame

between said first and second sidewalls, said edge member comprising:

first and second flat exterior planar side surfaces formed parallel to one another and defining a space therebetween;

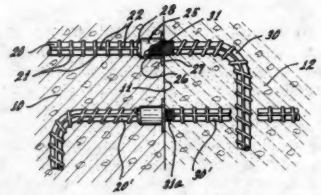
an elongated section having in cross section a first planar flat surface extending from one of said flat exterior planar surfaces of said edge member inwardly into said space and being inclined at an acute angle with respect to said one of said planar side surfaces, a second planar flat surface extending from the other flat exterior planar surface of said edge member inwardly into said space between said surfaces of said edge member and being inclined at an acute angle with respect to said other palnar side surface, one of said first and second planar flat surfaces extending inwardly from its adjoining side surface toward said frame and the other of said planar flat surfaces extending inwardly into said space from its adjoining side surface away from said frame, and a third planar flat surface forming with the planar surface extending away from said frame a male portion and forming with the planar surface extending toward said frame a female portion, said male and female portions engaging corresponding male and female portions of a identical edge member to guide said corresponding planar inclined surfaces into closely abutting relationship.

4,619,096

REBAR SPLICING AND ANCHORING

Harry B. Lancelot, III, Hurst, Tex., assignor to Richmond Screw Anchor Co., Inc., Richland Hills, Tex.

Filed Jan. 15, 1981, Ser. No. 225,206
Int. Cl.[4] E04C *3/30*
U.S. Cl. 52—726 **8 Claims**



1. A rebar splice, for splicing two rebars, both of which are embedded in concrete, each being a long bar having rib means for impeding turning in and pull-out from the concrete, the splice comprising:

a receiver head unitary with (secured) to one end of one of the rebars, having a threaded bore and an end face whose external surface is flush with an external, temporary concrete surface;

a threaded male head integral with and at one end of the other rebar and being inserted into and threadedly received directly by the receiver, and to be embedded in concrete, except for the threaded head, and

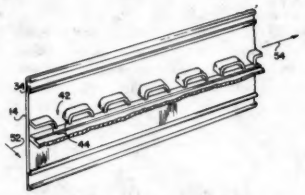
said rebars having embedded in different concrete structure portions which have been made at different times so that a first one of the rebars has been embedded first in one of the concrete structure portions, a respective second rebar having been threaded to the first one rebar prior to also being embedded in the other one of the concrete structure portions.

4,619,097

THERMALLY INSULATED COMPOSITE FRAME MEMBER AND METHOD FOR MANUFACTURE

Joseph A. Trummer, Atlanta, and El. L. Coulston, Norcross, both of Ga., assignors to Kawneer Company, Inc., Atlanta, Ga.

Filed Jul. 29, 1985, Ser. No. 759,692
Int. Cl.[4] B29D *27/04;* **E04B** *1/62*
U.S. Cl. 52—730 **16 Claims**



1. A thermally insulated composite structural framing member for use in window and curtain wall systems and the like, comprising:

and inner elongated structural element;

an outer elongated structural element, said elongated structural elements being positioned in adjacent spaced-apart relation with their longitudinal axes being substantially parallel;

upper and lower longitudinal walls projecting from mutually facing portions of each of said elongated structural elements to define opposing longitudinal channels;

a plurality of substantially lateral tabs depending from each of said upper channel walls to protrude inwardly of each of said opposing channels;

a connector of relatively low thermal conductivity formed in situ in said pair of opposing channels to substantially encapsulate said tabs and connect said inner and outer structural elements such that said tabs are embedded in said connector to prevent transverse displacement of said elongated structural elements with respect to said connector; and

mechanical means associated with each of said opposing channels for preventing lateral displacement of said elongated structural elements with respect to said connector.

4,619,098

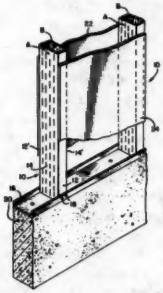
METALLIC STRUCTURAL MEMBER PARTICULARLY FOR SUPPORT OF WALLS AND FLOORS OF BUILDINGS

Lawrence H. Taylor, P.O. Box 49-58, 48th Street Station, Union City, N.J. 07087

Filed Oct. 19, 1984, Ser. No. 662,505
Int. Cl.[4] E04C *3/32;* **E04B** *1/88*
U.S. Cl. 52—738 **4 Claims**

1. A structural metallic member particularly useful for forming interior and exterior wall, floor and ceiling support means of building structures consisting of a hollow, generally quandrangular in transverse cross-section stud consisting of at least three contiguous walls with the middle of the at least three walls being provided with a multiplicity of parallel, spaced, longitudinal rows of longitudinally spaced slits, said slits having a width of about 15,000ths of an inch to thereby reduce transmission of heat and sound there across and to prevent convection of air currents therethrough, alternate rows of slits

being staggered such that the longitudinal spaces of one row are positioned substantially midway of the length of the slits of



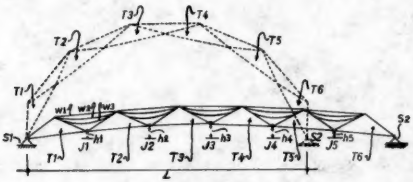
adjacent rows thereby further reducing sound and heat transmission across said at least three walls.

4,619,099

METHOD OF ERECTING ARCHED STRUCTURES

Oscar Sircovich, 5 Cremieux St., Jerusalem, Israel

Filed Aug. 17, 1984, Ser. No. 641,600
Claims priority, application Israel, Aug. 19, 1983, 69530
Int. Cl.[4] E04B *1/32, 1/35;* **E04H** *12/18*
U.S. Cl. 52—745 **8 Claims**



1. A method of erecting arched structures consisting of a plurality of rigid structured members, comprising the steps of:

(a) lining up on a flat surface in an upright position a series of structural members, each member forming a generally triangular truss having a base with two free ends and an apex at a point located above the base;

(b) pivotally connecting to each other adjacent ends of the members to form a continuous, interconnected row of members on the surface;

(c) tying to each other adjacent apexes by a plurality of cables of progressively increasing lengths, made of an elastically deformable material;

(d) hingedly supporting the free end of the first-in-line member;

(e) hingedly as-well-as slideably supporting the free end of the last-in-line member to enable sliding movement thereof along the surface in the direction of the hinge support;

(f) applying a force against the sliding support to cause its sliding movement while the row of members becomes erected into an arched form above the surface, and the shortest of each of the number of cables become taut; and

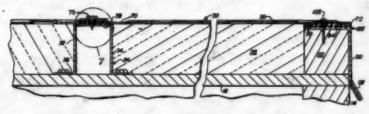
(g) maintaining the erected form of the row of members until the longest of each of the number of cables becomes elastically taut while the shorter cables become plastically deformed.

4,619,100

METHOD FOR FABRICATING A WATER IMPERVIOUS ROOF MEMBRANE

Robert T. Emblin, 5150 E. Paradise Dr., Scottsdale, Ariz. 85254

Continuation of Ser. No. 274,492, Jun. 17, 1981, abandoned.
This application May 8, 1984, Ser. No. 608,349
Int. Cl.[4] E04D *1/00*
U.S. Cl. 52—748 **22 Claims**



1. The method of installing a roofing system on a load bearing deck, said method comprising the steps of:

(a) securing a supporting frame structure including a plurality of elongated support members on top of the deck;

(b) a portion of the support members extending across the deck in laterally spaced, parallel relationship with respect to each other and extending upwardly from the deck by a defined height;

(c) installing rigid panels of insulation between the parallel support members up to said defined height to provide a substantially continuous top surface over the top of the parallel elongated support members and the insulation disposed therebetween;

(d) providing an outer skin section having parallel outer edges and dimensioned to overlap the parallel support members disposed on either side of the rigid insulation;

(e) freely disposing the outer skin section over the top surface of the insulation without bonding thereto with the outer edges of the outer skin section being registered with said parallel support members;

(f) fixedly securing the outer edges of the outer skin section to said parallel support members with mechanical fastener means;

(g) applying sealant means over the mechanical fastener means and outer edges of the skin section to produce a seal having watertight integrity along the securely fixed parallel outer edges on top of said parallel support members;

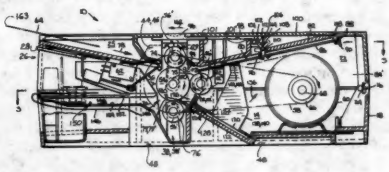
(h) whereby the outer skin section is allowed to freely expand and contract between said parallel support members without placing unnecessary stress on the supporting structure, thereby avoiding damage to the sealed, watertight integrity at the outer edges of the outer skin section.

4,619,101

SHEET FOLDING INSERTING MACHINE

Edward J. Havey, Jr., Stamford; Carl Miller, Fairfield, and Ted Westerman, Easton, all of Conn., assignors to Pitney Bowes Inc., Del.

Filed Dec. 16, 1985, Ser. No. 808,964
Int. Cl.[4] B65B *63/04*
U.S. Cl. 53—117 **6 Claims**



1. A simplified sheet folding and envelope inserting machine for folding sheets of paper and inserting the folded sheets into envelopes, said machine providing operator access to the sheet

folding and inserting components to facilitate jam clearance, said folding and inserting machine comprising:

A. a housing having a lower section defining a base and an upper section defining a cover, said cover being pivotally connected to said base so that said cover can be raised and lowered relative to said base,

B. means in said cover defining an entrance slot for feeding sheets into said folding and inserting machine and means located on said base defining an exit slot for folded sheets,

C. a plurality of folding rollers mounted in said housing for receiving sheets from said entrance slot and for delivering folded sheets to said exit slot,

D. a pair of buckle chutes in said housing located adjacent said folding rollers for receiving a portion of sheets from said rollers to cause said rollers to form folds in the portion of said sheets not received within said buckle chutes, one of said buckle chutes being located in said cover and the other of said buckle chutes being located in said base,

D (1) said one buckle chute being defined by an upper wall fixedly mounted in said cover and a lower wall in spaced parallel juxtaposition with said upper wall, said lower wall being pivotally connected to said cover whereby when said cover is raised from a closed to an open position, said upper wall separates from said lower wall to expose the inside of said one buckle chute,

D (2) said other buckle chute being defined by a lower wall fixedly mounted in said base and upper wall in spaced parallel juxtaposition with said lower wall, said upper wall being pivotally connected to said base whereby said upper wall can be raised from a normal position to an open position to expose the inside of said other buckle chute.

4,619,102

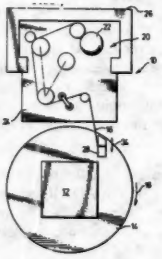
WRAPPER SEALING SYSTEM

Wolfgang Geisinger, Rosemere, Canada, assignor to Muller Manufacturing Ltd, Montreal, Canada

Filed Oct. 26, 1984, Ser. No. 665,057

Int. Cl.[4] B65B *13/02*

U.S. Cl. 53—399 **10 Claims**



1. A method of wrapping a charge with a synthetic film comprising holding an end of a film in a clamp mounted on a moveable platform, providing an anvil, a sealing means and a cut-off means on said moveable platform, raising said anvil to a raised position relative to said platform positioning said anvil against said charge by moving said platform adjacent said charge to simultaneously move said clamp, said sealing means and said cut off means into position adjacent said charge, commencing wrapping of said film around said charge by relatively rotating said charge and a source of said film, releasing a first jaw of said clamp to free said film when said film is retained on said charge, retracting a cooperating jaw of said clamp to a retracted position clear of the path of said film while completing the wrapping of said charge with said film, wrapping a first lap of film over said anvil, moving said cooperating jaw to its initial position in overlying position to said first lap while wrapping a last lap around said charge and over said anvil and said cooperating jaw, moving said first jaw into clamping position relative to said cooperating jaw and securing said first lap to said last lap over said anvil, cutting said last lap between said anvil and said clamp and moving said anvil to a lowered position clear of said film.

8. An apparatus for wrapping a charge with a film comprising a turntable for supporting said charge, a source of film, a platform mounted on said turntable for substantially horizontal movement toward and away from said charge, means for moving said platform relative to said table, an anvil mounted on said platform for substantially vertical movement between a lower inoperative position and an elevated active position, a securing means mounted on said platform, means for moving said securing means to a position to cooperate with said anvil when said anvil is in elevated position to seal overlying layers of said film overlying said anvil, a clamp mounted on said platform, said clamp including a pair of jaws, means to independently move each of said jaws between a clamping position and a non-clamping position clear of the path of said film, cut off means mounted on said platform in position to sever said film between said clamp and said anvil.

4,619,103

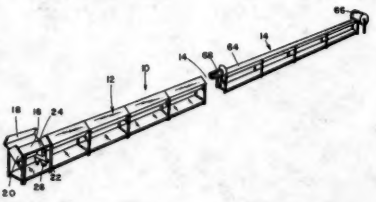
ASSEMBLY METHOD AND APPARATUS

C. Robert Kenrick, 17850 Hiawatha, Spring Lake, Mich. 49456

Filed Aug. 2, 1983, Ser. No. 519,502

Int. Cl.[4] B65B *31/02*

U.S. Cl. 53—432 **9 Claims**



8. A method of packaging flexible hose comprising the steps of:

supporting an elongated section of flexible hose in an elongated housing; placing a movable piston in one end of said housing in peripherally sealed relationship to said housing; placing a packaging container in the second end of said housing to receive the flexible hose; applying suction to said second housing end, both inside and outside of said flexible hose, to cause a pressure differential across said piston without creating a pressure differential across the hose, and thereby causing said piston to travel from said first housing end to said second housing end for axial compression of said flexible hose into said packaging container.

4,619,104

NET BAG FORMING METHOD AND MACHINE

Gary Germunson, Yakima County, Wash., assignor to Yakima Wire Works, Inc., Yakima, Wash.

Filed Jan. 31, 1985, Ser. No. 696,723

Int. Cl.[4] B65B *9/13*

U.S. Cl. 53—459 **22 Claims**

1. A net bag forming machine for spreading and opening continuous tubular rope net material which has been radially compacted and stored on a reel, comprising:

a free-floating, heavy spherical mandrel which is free to rotate about three perpendicular axes for expanding continuous rope net bag material;

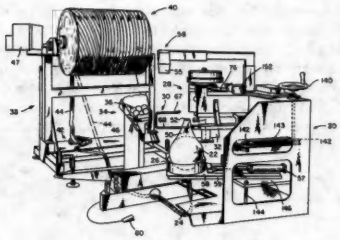
a basin having a depression for entrapping the mandrel

against substantial lateral movement and for supporting the mandrel; and

means within the basin for guiding the net bag material through the basin to the mandrel, wherein the mandrel slides within the tubular net bag material and is supported by the basin to spread the material for receiving articles to be bagged.

17. A method for forming tubular net bags from a reel of continuous rope net material comprising the following steps:

drawing continuous rope net material upwardly through a supporting means;



feeding the material around a free-floating spherical mandrel of sufficient weight to expand the net material to its lay-flat dimension and free to rotate about three perpendicular axes;

closing a portion of the expanded net material above the mandrel to form the bottom of a net bag;

separating the bottom of the bag from the continuous net material; and

loading the bag with a predetermined volume of articles wherein the maximum vertical distance through which the articles must fall does not exceed the length of the bag, thereby preventing bruising of delicate produce.

4,619,105

MOWING APPARATUS

Toru Baba, Yokosuka, Japan, assignor to Kioritz Corporation, Tokyo, Japan

Filed Feb. 4, 1985, Ser. No. 697,783

Claims priority, application Japan, Feb. 7, 1984, 59-15885

Int. Cl.⁴ A01D *34/84*; F16B *35/06*

U.S. Cl. 56—12.7 **3 Claims**

1. A mowing apparatus comprising:

a casing containing a cutter; and

a connecting member having a head formed with a groove on its surface for inserting a tool to tighten or loosen said connecting member, said connecting member connecting said casing from below to a driveshaft to rotate the casing in a predetermined direction;

wherein the improvement comprises:

an anterior portion having a greater height than a posterior portion formed along said groove on the surface of the head of said connecting member with respect to the direction of rotation of the casing for preventing said groove from being clogged, the upper surface of said bolt head being generally planar, and said anterior portion having a greater height constituting an elongated rib extending upwardly from said generally planar surface along a portion of the edge of said groove.

4,619,106

BALERS

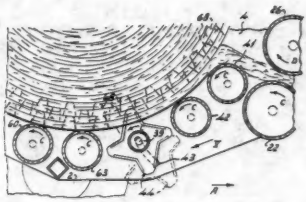
Cornelis van der Lely, Zug, Switzerland, assignor to C. van der Lely N.V., Maasland, Netherlands

Filed Nov. 29, 1984, Ser. No. 676,306

Claims priority, application Netherlands, Dec. 1, 1983, 8304137

Int. Cl.⁴ A01D *39/00*

U.S. Cl. 56—341 **45 Claims**



23. A baler comprising a pick-up device for picking up crop lying on the ground, a bale forming space and a binding mechanism for displacing a binding element inwardly of a bale thereby to interconnect layers of crop in said bale.

4,619,107

WHEEL FOR DRAWING HELICAL GROOVE RING FOR OPTICAL FIBERS

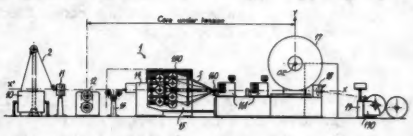
Bernard M. Missout; Jean-Pierre Michaux, and Jean-Luc A. Piova, all of Paris, France, assignors to Societe Anonyme de Telecommunications and Societe Industrielle de Liaisons Electriques, both of Paris, France

Filed May 29, 1985, Ser. No. 739,044

Claims priority, application France, May 30, 1984, 84 08531

Int. Cl.⁴ H01B *13/02*; G02B *6/04*

U.S. Cl. 57—6 **2 Claims**



1. Apparatus for forming an optical fiber cable including a longitudinally stretchable and shrinkable ring member (2) containing a plurality of parallel helical grooves (20) for receiving optical fibers (3), comprising

(a) means (10) for supplying an indeterminate length of the ring member to a store means (190);

(b) means for temporarily tensioning an intermediate portion of said ring member between said ring member supply means and said store means, thereby to stretch said intermediate portion, said tensioning means including

(1) brake wheel means (12) adjacent said supply means for braking the trailing end of said ring intermediate portion; and

(2) drawing wheel means (17) adjacent said winding means for drawing the leading end of said intermediate portion, the radius (R') of said drawing wheel being such that

$$R' = (p^2/4\pi^2 r) - (r + h)$$

where
p=the pitch of the helical grooves
h=the depth of the helical grooves
r=the radius of a central portion of said ring member circumscribed by the bottoms of the grooves; and

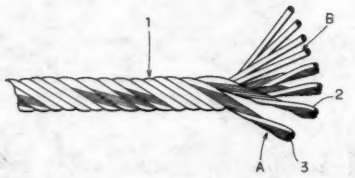
(c) means (150) arranged between said brake wheel means and said drawing wheel means for introducing optical fibers into the helical grooves contained in said stretched intermediate portion, whereby upon shrinkage of said intermediate ring portion after passage through said tensioning means, the optical fibers have a length greater than the length of the corresponding grooves in said ring member.

4,619,108

MULTIPLE STRAND TWINES COMPRISING MONOFILAMENTS AND MULTIPLE FILAMENTS, AND FISHNETS FORMED THEREOF

Keiji Hotta, Mie, Japan, assignor to Amikan Fishing Net Mfg. Co., Ltd., Yokkaichi, Japan

Filed Apr. 19, 1985, Ser. No. 725,271
Int. Cl.[4] D04G *1/00*; D02G *3/02, 3/38*
U.S. Cl. 57—236 **4 Claims**



1. A multiple strand synthetic resin twisted twine comprising,

(a) a multiple strand of a plurality of multiple filaments of a synthetic resin and a monofilament of said synthetic resin twisted together in a first direction;

(b) at least one monostrand of one monofilament of said synthetic resin twisted alone in said first direction;

said first direction twisted multiple strand and said at least one monostrand twisted alone in said first direction being combined and over twisted together in a second direction opposite to said first direction.

4,619,109

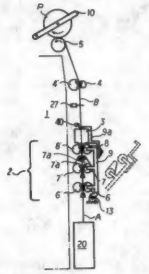
METHOD AND APPARATUS FOR YARN PIECING IN A FASCIATED YARN SPINNING UNIT

Yoshihisa Suzuki, Chiryu; Yoshiharu Yasui, Toyota, and Kazuo Seiki, Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Sep. 28, 1983, Ser. No. 536,886
Claims priority, application Japan, Oct. 5, 1982, 57-173845
Int. Cl.[4] D01H *15/00, 15/02, 5/28*
U.S. Cl. 57—261 **11 Claims**

1. A method of yarn piecing in a spinning unit comprising a fiber drafting mechanism having plural pairs of top and bottom drafting elements including at least back and front pairs for drafting a fibrous material into an attenuated fiber bundle, a false-twisting nozzle having a yarn passage channel extended therethrough in which the attenuated fiber bundle is false-twisted by the action of a fluid jet into a strand of yarn to be wound up in a package, and a yarn sensor for detecting a break in the yarn, said method comprising the steps of breaking off the fiber bundle in the drafting zone of the drafting mechanism leaving a broken end thereof within said drafting zone, moving said top and bottom drafting elements apart and substantially concurrently opening an axial gap extending to and along said yarn passage channel of said false-twisting nozzle to open said drafting mechanism and said channel continuously along their respective lengths, picking and drawing out a broken yarn end from the package, cutting off the yarn drawn out from the package to a predetermined length thereof as measured from said package, introducing an intermediate portion of the yarn in lateral direction into said opened fiber drafting mechanism and yarn passage channel, said predetermined length being established such that a cut end of the yarn may at least overlap said broken end of the fiber bundle within said drafting zone, moving said top and bottom drafting elements together and substantially concurrently closing said gap to close said yarn passage channel, advancing the overlapped ends within the drafting zone and then through said yarn passage channel in the false-twisting nozzle, and false-twisting said overlapped ends to thereby piece the same together within said channel.

5. In a yarn spinning unit of the false-twisting type having a fiber drafting mechanism including at least respective back and front aligned pairs of rotatable drafting elements for receiving and drafting sliver therebetween, the drafting elements in each



said pair normally engaging the other drafting element of the pair, and a false-twisting nozzle aligned with said aligned pairs of drafting elements and having a yarn passage channel extending therethrough in said direction of alignment for receiving and spinning said sliver, the improvement comprising yarn piecing apparatus for piecing a broken yarn being spun in said spinning unit and comprising means for moving one of said drafting elements in each said pair thereof out of its said engagement with the other drafting element of the pair whereby all of said pairs of drafting elements are concurrently opened laterally for receiving said broken yarn when a length thereof is moved in lateral direction between all of said opened pairs, means for opening said yarn passage channel laterally along its length for concurrently receiving said length of the yarn in lateral direction within and along the length of said channel when said yarn length is moved laterally between said opened pairs of drafting elements, and means for closing said yarn passage channel and moving said opened pairs of drafting elements to their said normally engaging positions.

4,619,110

HELICOPTER ENGINE WARNING OR CONTROL SYSTEM

M. Samuel Moore, 11623 Seminole Cir., Northridge, Calif. 91324

Continuation-in-part of Ser. No. 513,458, Jul. 13, 1983, abandoned. This application May 2, 1985, Ser. No. 729,547
Int. Cl.[4] F02C *9/28*
U.S. Cl. 60—39.091 **10 Claims**

1. A helicopter turbine engine over-stress warning and protection system comprising:

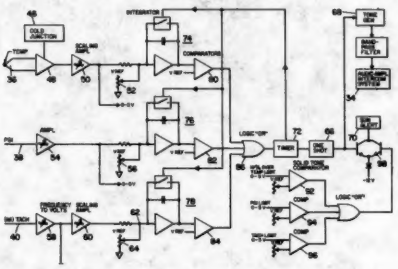
a helicopter;

a helicopter turbine engine mounted in said helicopter to power the helicopter;

means for sensing at least one critical operating parameter of

said helicopter engine, such as the temperature, output torque or engine speed of rotation;

means including an audio signal system for warning the helicopter pilot of incipient engine over-stressing conditions relating to at least one helicopter engine operating parameter, said means including audio output means, and circuit means for initiating operation of said audio signal output means to produce an initial warning signal when the over-stress conditions are a predetermined level below allowable limits, and for increasing the audio output and



therefore the urgency of said audio warning signal as the limits, are approached;

the system further including means for automatically limiting fuel flow to the helicopter engine to avoid overstressing thereof; and

override actuation means for disabling said limiting means and permitting increased fuel flow to the helicopter engine under emergency conditions;

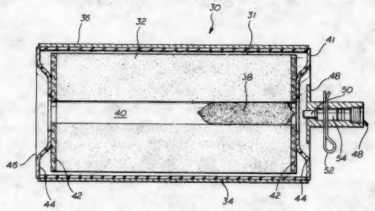
whereby a helicopter pilot may be warned of dangerous engine stressing conditions despite preoccupation with helicopter maneuvering matters.

4,619,111

OILFIELD CLOSING DEVICE OPERATING SYSTEM

Jack Whiteman, Houston, Tex., assignor to Hydril Company, Los Angeles, Calif.

Filed Sep. 7, 1984, Ser. No. 648,533
Int. Cl.[4] F01B *29/08*
U.S. Cl. 60—632 **19 Claims**



1. A system for generating pressurized hydraulic fluid to operate an oilfield apparatus comprising:

an oilfield closing device means for closing the oilfield apparatus,

a solid propellant gas generator means for generating high pressure gas when actuated,

a pressure vessel containing hydraulic fluid,

a first conduit connected between the output of said gas generator means and the pressure vessel,

a second conduit having a check valve therein connected between said pressure vessel and a closing port of a hydraulically driven piston of said oilfield closing device, and

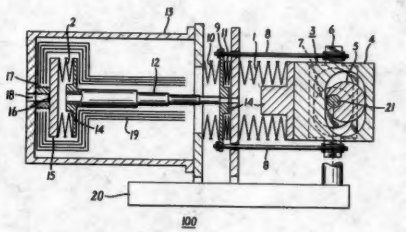
actuating means for actuating said gas generator means, operably causing said high pressure gas to be conducted via said first conduit to force hydraulic fluid in said pressure vessel under pressure via said second conduit to said closing port, said check valve in said second conduit operably preventing fluid pressure in the closing port of said oilfield closing device from feeding back to said pressure vessel.

4,619,112

STIRLING CYCLE MACHINE

Stirling A. Colgate, Los Alamos, N. Mex., assignor to Colgate Thermodynamics Co., Princeton, N.J.

Filed Oct. 29, 1985, Ser. No. 792,689
Int. Cl.[4] F25B *9/00*
U.S. Cl. 62—6 **30 Claims**



1. A Stirling cycle machine comprising: first and second variable-volume, compression-expansion chambers containing a gas; a regenerator interconnecting the first and second chambers for conducting the gas therebetween; and means for driving the first and second chambers, the regenerator having one or more channels each defined by spaced-apart channel walls supported by wall members having a relatively low longitudinal thermal conductivity and comprising a heat capacity material of a relatively high specific heat, the regenerator having a plurality of longitudinal sections of predetermined length, the channels having a uniform predetermined channel wall spacing and thickness of the heat capacity material in each section, wherein the machine is adapted to operate with the gas in the first chamber at a higher temperature than the gas in the second chamber and the length of each section and the thickness of the heat capacity material in each section progressively decrease in the direction from the second chamber to the first chamber and the spacing of the channel walls and the lateral extent of the channels in each section progressively increase in the direction from the second chamber to the first chamber.

4,619,113

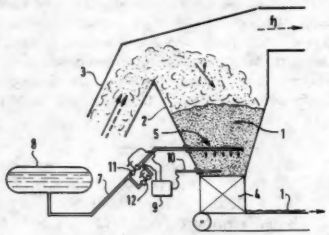
PROCESS AND INSTALLATION FOR COOLING A POWDER BY MEANS OF A REFRIGERATING FLUID

Gérard Dubrulle, Lambersart, and Alain Roullet, Villejuif, both of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jun. 20, 1985, Ser. No. 747,013
Claims priority, application France, Jun. 22, 1984, 84 09810
Int. Cl.[4] F25D *17/02*
U.S. Cl. 62—64 **21 Claims**

1. A process for cooling a mass of powder contained in a fixed receiving hopper by means of a refrigerating fluid, comprising injecting the refrigerating fluid in the liquefied state through an injection device having a plurality of orifices

within the mass of powder contained in the hopper and substantially below the surface of the mass of powder so that the



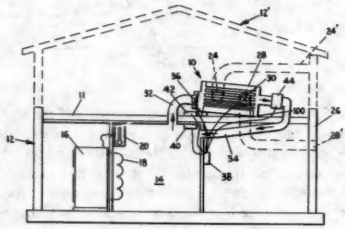
refrigerating fluid directly contacts the mass of powder while the refrigerating fluid is still in the liquefied state.

4,619,114

AUXILIARY OUTSIDE AIR REFRIGERATING MECHANISM

Ralph Wilson, 10739 Chicago Dr., Zeeland, Mich. 49464

Filed Oct. 15, 1985, Ser. No. 787,625
Int. Cl.[4] F25B *25/00*
U.S. Cl. 62—180 **16 Claims**



1. An auxiliary outside air refrigerating means for a refrigerated storage room such as a cooler or the like comprising:

a heat exchanger having two pairs of inlets and outlets for receiving and re-circulating air supplies from two separate sources and a heat exchange means for transferring heat between the two air supplies without admixing the two air supplies, a first inlet and outlet being connected to the air in the storage room, a second inlet being connected to a source of outside air;

a storage room air fan for re-circulating storage room air through the heat exchanger;

an outside air fan for circulating outside air through the heat exchanger; and

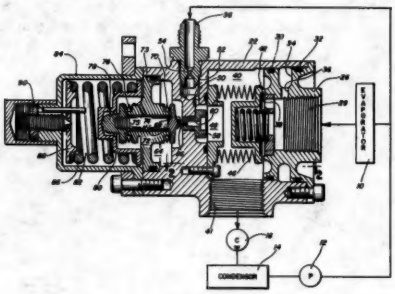
control means for automatically actuating the storage room air fan and outside air fan whenever both the cooler temperature rises to a first predetermined temperature indicative of an upper storage room limit and the outside air temperature is no greater than a second predetermined temperature below the upper storage room limit, the control means de-actuating at least one of the fans whenever the storage room temperature drops to a third predetermined temperature indicative of any lower storage room limit, the first predetermined temperature setting being below any fourth predetermined temperature setting for actuating a conventional storage room refrigeration unit, such that the storage room refrigeration unit does not operate as long as the auxiliary outside air refrigeration means is effectively cooling the air in the storage room.

4,619,115

BACK PRESSURE REGULATING VALVE

Kent Weber, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed May 30, 1985, Ser. No. 739,212
Int. Cl.[4] F25B *41/04*
U.S. Cl. 62—217 **10 Claims**



1. An evaporator system including:

an evaporator;

a condenser upstream of the evaporator;

a compressor connected to said condenser; and

a back pressure regulating valve downstream of the evaporator to regulate the pressure in the evaporator, said valve comprising:

a housing having an inlet connected to an evaporator and an outlet connected to said compressor;

a valve seat within said housing and functionally interposed between said inlet and said outlet;

a poppet within said housing and mounted for movement therein toward and away from said seat by a bellows, said bellows defining an expandable chamber, which when expanding, moves said poppet toward said seat;

a control fluid inlet to said chamber and connected to said evaporator on the upstream side thereof;

a control fluid outlet for said chamber;

a pressure responsive valve for controlling control fluid flow from said fluid outlet;

means including a fluid connection to said inlet, for applying an opening force to said pressure responsive valve; and

means for applying a closing force to said pressure responsive valve.

4,619,116

APPARATUS FOR MAKING ICE CREAM

Guido Cristante, Omegna, Italy, assignor to I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomestici, Crusinallo di Omegna, Italy

Filed Apr. 9, 1984, Ser. No. 598,371
Claims priority, application Italy, Apr. 13, 1983, 20559 A/83
Int. Cl.[4] A23G *9/00*
U.S. Cl. 62—233 **2 Claims**

1. An apparatus for making ice cream comprising:

a housing formed with an upper surface and provided with a pair of spaced-apart upwardly open generally cylindrical recesses;

respective shafts journaled in said housing and coaxial with said recesses;

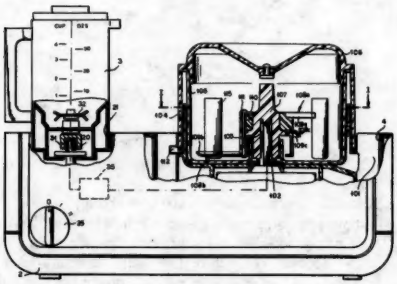
means forming a blender received in one of said recesses and including a blender container adapted to receive an ice cream mixture, and a blender blade engageable on the shaft of said one of said recesses for rotation thereby;

a treatment vessel in the other of said recesses for receiving said mixture following preparation thereof in said blender

for subjecting same to stirring to transform the mixture into ice cream;

a stirrer in said vessel engaged on said shaft of said other recess and including at least three blades in a substantially equispaced relationship including an outwardly and forwardly curved upper blade extending in a sense of rotation of said stirrer and formed with a downwardly turned trailing edge,

an outwardly and forwardly curved lower blade extending in said sense of rotation and having an upwardly turned



trailing edge, and an outwardly and forwardly curved intermediate blade between said upper and lower blades and formed with a trailing edge extending from a plane of said intermediate blade;

a variable speed motor in said housing operatively connected to said shafts; and

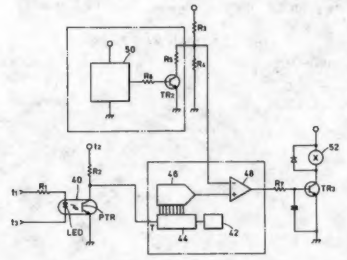
control means on said housing operatively connected to said motor for operating at least said stirrer at a plurality of different speeds in successive phases of transformation of said mixture into ice cream.

4,619,117

AUTOMATIC ICE MAKING MACHINE

Yoshinori Ito, Toyoake, Japan, assignor to Hoshizaki Electric Company, Ltd., Sakae, Japan

Filed Jan. 13, 1986, Ser. No. 818,304
Int. Cl.[4] F25C *1/00*
U.S. Cl. 62—233 **6 Claims**



1. In an automatic ice making machine which comprises a freezing chamber formed to define a plurality of open bottom freezing cells, a water plate provided under the freezing chamber for supplying water to be frozen to spray said water into the freezing cells, a water tank provided under the water plate for storing a necessary amount of water to be frozen for one freezing cycle, a water inlet valve connected to a feed pipe for supplying water to the water tank, and a water inlet valve controlling timer circuit for controlling the opening and closing of the water inlet valve, wherein during a defrosting portion of the ice-making cycle, the water plate and the water tank are caused to be inclined downwardly so as to discharge ice cubes, said water inlet valve controlling timer circuit comprising:

first means for permitting said water inlet valve to open for a first predetermined period of time,

second means for permitting said water inlet valve to open for a second predetermined period of time which is shorter than said first predetermined period of time, and

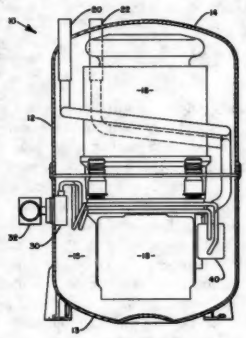
changeover means which selects said first means only during an initial freezing cycle and switches to said second means during second and subsequent freezing cycles.

4,619,118

REVERSIBLE COMPRESSOR

Tsuwei Chu, Liverpool, and Prakash N. Pandeya, Clay, both of N.Y., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 5, 1984, Ser. No. 668,541
Int. Cl.[4] F25B *13/00*
U.S. Cl. 62—324.1 **10 Claims**



1. A reversible hermetic compressor unit comprising:

shell means;

compressor means within said shell means;

motor means within said shell means for driving said compressor means in only one direction;

valve means within said shell means;

a first fluid line extending through said shell means and connected to said valve means;

a second fluid line extending through said shell means and connected to said valve means;

a compressor discharge line extending from said compressor means to said valve means;

means for reversibly moving said valve means between a first position in which said compressor discharge line is fluidly connected to said first fluid line and a second position in which said compressor discharge line is fluidly connected to said second fluid line whereby the output of said compressor means can be selectively directed through either one of said first and second fluid lines; and

said valve means further including means for connecting said second fluid line to the interior of said shell means when said valve means is in said first position and for connecting said first fluid line to the interior of said shell means when said valve means is in said second position.

4,619,119

HEAT PUMP COMPRISING A THERMALLY DRIVEN LIQUID PUMP AND LIQUID PUMP FOR USE IN A HEAT PUMP

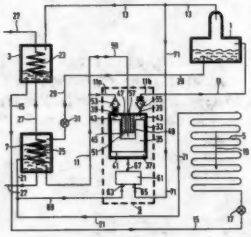
Kees Dijkstra, and Jan Huizinga, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 585,954, Mar. 5, 1984, abandoned. This application Jan. 29, 1985, Ser. No. 695,987

Claims priority, application Netherlands, Mar. 5, 1984, 8304359

Int. Cl.[4] F25B *13/00*

U.S. Cl. 62—324.2 8 Claims



1. A heat pump comprising a first circuit in which a working medium is passed from a generator (1) successively to a condenser (3), an evaporator (5) and an absorber (7) and a second circuit in which a solution of the working medium and a solvent which is comparatively poor in working medium content is passed from the generator (1) to the absorber (7) and a solution of the working medium and a solvent which is comparatively rich in working medium content is passed from the absorber (7) to the generator (1), the transport of the rich solution from the absorber (7) to the generator (1) taking place by means of a liquid pump (9) arranged in a connection between the absorber (7) and the generator (1) and having a liquid piston (35) which is displaceable in a cylinder (33) in a reciprocatory manner and whose movement is reversible by means of a gas switch (61, 173, 281), which alternately connects a working surface (41) of the liquid piston (35) to gaseous working medium in the heat pump at a comparatively low and at a comparatively high pressure level, characterized in that the said working surface (41) constitutes a first working surface (41) of the liquid piston (35) facing a gas chamber (37) located in the cylinder (33), which piston further has a second working surface (43) which faces a liquid chamber (39) located in the cylinder (33) and which is smaller than the first working surface (41) and is separated therefrom by a liquid piston (35), the gas chamber (37) being connected to the gaseous working medium in the heat pump alternately at a comparatively low and high pressure level, whilst synchronously therewith the liquid chamber (39) is connected to the liquid solution in the heat pump alternately at a comparatively low and a comparatively high pressure level, which cylinder (33) is provided with a guide member (47) for the piston (35) arranged in the liquid chamber (39) and passed into a recess (49) in the piston (35), whilst an end face (45) of the guide member (47) constitutes with the recess (49) an auxiliary chamber (51) having a variable volume of liquid solution, whose pressure level at least during the delivery stroke of the liquid piston (35) is substantially equal to the low pressure level of the liquid solution in the heat pump.

4,619,120

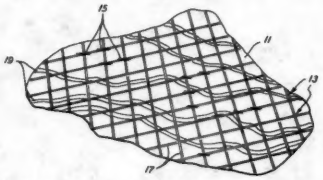
DOUBLE LAYER FABRIC MATERIAL AND METHOD FOR MANUFACTURING SAME

Harry Markowitz, Great Neck, N.Y., assignor to Bruedwill, Inc., New York, N.Y.

Filed Jun. 29, 1984, Ser. No. 626,397

Int. Cl.[4] C03B *15/14*

U.S. Cl. 66—192 17 Claims



1. A double layer fabric material comprising:

a first web bearing on one side a printed design having at least one group of parallel printed elongate shapes; and

a knitted second web substantially on said one side of said first web, said second web having a multiplicity of knitted stitches penetrating and threadingly engaging said first web, whereby said second web is attached to said first web, said second web having a substantially orthogonal yarn structure with a first set of substantially parallel spaced yarns and a second set of substantially parallel spaced yarns, the yarns of said first set extending substantially perpendicularly to the yarns of said second set, said yarns having yarn sizes, yarn colors and interyarn distances coordinated with said printed design to form a visually detectable pattern different from said printed design and different from said substantially orthogonal yarn structure, one of said sets of yarns extending substantially parallel to said elongate shapes.

4,619,121

SEAL FOR TUNNEL WASHING MACHINES

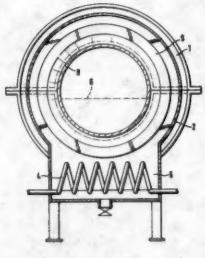
Alexander Mollerus, and Robert Mollerus, both of Friedhofstr. 13, D-7128 Lauffen, Fed. Rep. of Germany

Filed Oct. 9, 1984, Ser. No. 658,601

Claims priority, application Fed. Rep. of Germany, Oct. 14, 1983, 3337236

Int. Cl.[4] D06F *21/02, 37/04*

U.S. Cl. 68—16 11 Claims



1. A rotating tunnel washing machine, comprising:

a rotatable cylindrical tunnel provided with a central region having a plurality of perforations formed therethrough;

a housing circumaxially surrounding a portion of the external periphery of the tunnel, said housing having first and second side walls, on respective sides of the tunnel central

region defining an annular trough about said tunnel for retaining a washing fluid; and

first and second gaskets sealingly cooperating with said tunnel, affixed outside of the housing, the first gasket adjacent the first side wall and the second gasket adjacent the second side wall, each gasket defining an annular gasket cavity about the tunnel and provided with a section thereof maintained in fluid-tight contact with the side wall by the pressure of the washing fluid.

4,619,122

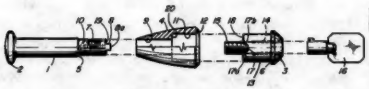
THREADABLY ENGAGED LOCKING MECHANISM

Harold N. Simpson, 10 Paul VI, Chateauquay, Quebec, Canada

Filed Dec. 24, 1984, Ser. No. 686,033

Int. Cl.⁴ E05B *67/36*

U.S. Cl. 70—34 **9 Claims**



1. A threadably engaged locking mechanism comprising:

(a) a first locking element, in the form of a mushroom-headed pin, provided with a threaded portion on one end thereof;

(b) a second locking element in the form of a lock assembly mechanism having formed on said second element a complementary threaded element to the threaded portion of said first locking element;

(c) a pair of complementary longitudinally engageable rotational stop means being respectively formed on said first and second locking elements, said pair of stop means being encased in a protective casing that prevents direct access thereto from the exterior,

wherein the said pair of stop means may be drawn into interengagement by advancing the threaded engagement between said first and second locking elements; and wherein the threaded element on said second locking mechanism is attached to a key-receiving core within and lockably engageable with a housing forming part of said lock assembly and wherein said stop means associated with said lock assembly mechanism is attached to said housing.

4,619,123

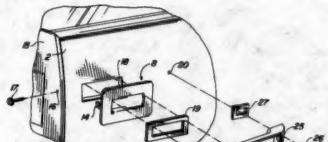
GUARD PLATE AND METHOD FOR AUTOMOBILE DOOR HANDLE

Mark L. Hill, 512 So. 4th Ave., Tucson, Ariz. 85701

Filed Jan. 14, 1985, Ser. No. 691,541

Int. Cl.⁴ E05B *63/00*

U.S. Cl. 70—417 **9 Claims**



1. A mechanism for preventing unauthorized forcing of the lock of an automobile door by means of a screwdriver or the like, the mechanism comprising:

(a) a rigid guard plate having an aperture therein and having integral first and second flanges extending inwardly from opposed upper and lower edges of the aperture into an opening in an outer surface of the automobile door;

(b) a handle mechanism having a handle portion and also having an operative portion extending through the aperture in the guard plate and through the opening for actuating a latching mechanism; and

(c) means for anchoring the operative portion of the handle mechanism to an interior portion of the door and simultaneously anchoring the guard plate to the interior of the door.

4,619,124

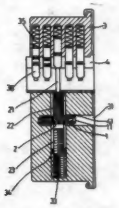
CYLINDER LOCK WITH ANTI-PICKING DEVICE

Yau-Jung Pan, 4th Fl., No. 22, Kan Chou St., Taipei, and Sheng-Yi Chen, No. 33-1, Chung Hu Rd., 4 Lin, Ching Hu Village, Lin Kou Hsiang, both of Taiwan

Filed Sep. 16, 1985, Ser. No. 776,788

Int. Cl.⁴ E05B *17/14, 15/06*

U.S. Cl. 70—419 **3 Claims**



1. A cylinder lock with a body, a cylinder rotatably retained in said body with a keyhole extending into the cylinder to define a keyway and a plurality of spring-loaded pin tumblers, characterized in that it further comprises a mechanism to prevent a foreign object from entering said keyway, said mechanism comprising a shaft and a worm; said shaft being retained in a first tunnel in said body extending in the radial direction of said cylinder to rotate around its own axis and to shift between a first position in which one of its end extends into said keyway and a second position in which its said end is fully retracted from said keyway;

said shaft comprising three sections, including a first section for extending into the range of said keyway, a second section provided with equidistant ridges spaced around its periphery to define a gear to engage with said worm, and a threaded third section;

said first tunnel being provided with means to engage with said threaded third section so that the rotation of said shaft around its own axis is accompanied by an axial movement along its axial direction;

said worm being retained in a second tunnel perpendicular to said first tunnel to rotate around its own axis, said second tunnel having an opening on the surface of said lock, the end of said worm facing to the opening being shaped to adapt to a special tool.

4,619,125

KEY HOLDER WITH CHANGEABLE INDICIA DISPLAY

Won H. Choi, 43 W. 27th St., New York, N.Y. 10001

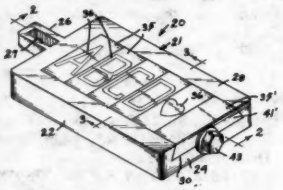
Filed Jul. 6, 1984, Ser. No. 628,472

Int. Cl.⁴ E05B *19/24*

U.S. Cl. 70—460 **6 Claims**

1. A key holder apparatus comprising a body having upper and lower surfaces, first and second ends and side walls, means adjacent said first end for supporting a key from said body, a channel within said body, said channel having a pair of opposed guide walls within said body and between said upper and lower surfaces and extending from adjacent said first end thereof toward said second end, at least one slide means sup-

ported within said channel, locking means abutting at least one of said slide means for securing said slide means within said channel of said body, said locking means being selectively adjustable to permit said slide means to be removable from said body therefrom whereby preselected slide means may be selectively positioned and retained within said body of the key holder including a plurality of said slide means, at least one of



said slide means having indicia displayed thereon, in which said locking means includes an elongated shaft means, said elongated shaft means having a screw threaded portion and a head portion, an elongated opening disposed between said slide means and said lower wall portion of said channel and extending from said second end towards said first end of said body, said elongated shaft means being selectively extended within said elongated opening.

4,619,126

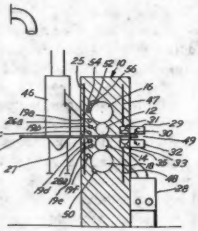
LUBRICANT REMOVAL SYSTEM FOR COLD ROLLING STAND

Ronald E. Kolecki, Russellville, Ky., assignor to Atlantic Richfield Co., Los Angeles, Calif.

Division of Ser. No. 720,456, Apr. 4, 1985, Pat. No. 4,552,003, which is a division of Ser. No. 521,050, Aug. 8, 1983, abandoned. This application May 24, 1985, Ser. No. 737,773

Int. Cl.[4] B21B *9/00, 27/10, 45/02*

U.S. Cl. 72—38 **6 Claims**



1. In an apparatus for cold rolling of nonferrous metal, said apparatus of the type including a roll stand having an inlet side and an outlet side, opposed work rolls in the stand for rolling metal as the metal form passes between the rolls in a direction from the inlet side to the outlet side, coolant application means in the roll stand for applying coolant to the metal and rolls during rolling; a gas discharge assembly mounted on the stand to impinge gas on the form passing from the rolls; suction boxes mounted on the stand on opposite sides of the metal form at the outlet side of the mill at a position upstream from the gas discharge assembly, the improvement comprising, in combination; a hood collection assembly for collecting coolant and the gas from the suction boxes and from the roll stand, for separating and recovering coolant, and for supressing any combustion of the effluent coolant and gas collected by the assembly, said assembly including a shroud positioned on the inlet and outlet side of the roll stand to substantially enclose the rolled metal form in the roll stand prior to entry into the rolls and upon exit from the rolls; a plurality of suction lines connected to the suction boxes and the hood, said lines connected to a common single suction passage; at least one trap in the passage; a fluid pump upstream from the traps for drawing coolant and gas into the hood and suction boxes; a gas discharge outlet upstream from the fluid pump; combustible gas sensors located in the suction box and roll stand hood for sensing a combustible mixture in the fluid and gas mixture drawn into the assembly through fluid lines; and means for feeding a non-combustible gas into said fluid lines to suppress potential combustion.

4,619,127

ELECTROMAGNETIC FORMING METHOD BY USE OF A DRIVER

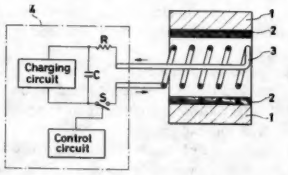
Toshio Sano, Yatabemachi; Masaharu Takahashi, Takezono; Yoichi Murakoshi, Yatabemachi, and Kenichi Matsuno, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Feb. 26, 1985, Ser. No. 705,524

Claims priority, application Japan, Feb. 29, 1984, 59-39056

Int. Cl.[4] B26D *26/14*

U.S. Cl. 72—56 **6 Claims**



1. A method of electromagnetic forming, comprising the steps of:

disposing on the surface of a workpiece a driver obtained by superposing a highly electroconductive metal foil repeatedly over itself wherein said driver serves to act as a secondary coil which opposes a primary coil;

feeding an electric current to said primary coil so as to produce an induced current in said driver; and

forming said workpiece with the repulsive force generated by the induced current generated in said driver.

4,619,128

SPINDLE FOR ROTOPEENING APPARATUS

Douglas G. Harman, Pensacola Beach, Fla.; Richard A. Green, Farmington Hills, Mich., and Bruce W. Bevilacqua, Penn Township, Westmoreland County, Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 7, 1985, Ser. No. 731,250

Int. Cl.[4] B24C *3/16;* **C21D** *7/06*

U.S. Cl. 72—53 **28 Claims**

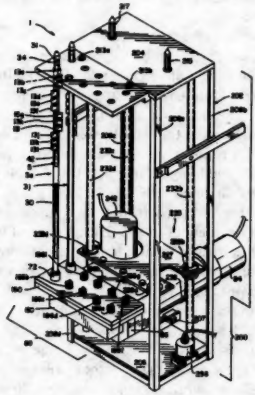
1. A peening spindle for rotopeening the inside wall of a conduit, comprising:

(a) a rigid, rotatable and reciprocable housing having a substantially continuous outer surface with an opening along its side, said housing being insertable within the conduit;

(b) a mandrel having at least one peening means connected thereto, and

(c) bearing means located within and supported by the housing for rotatably mounting the mandrel within the housing off-center relative to the longitudinal axis of the housing

with the peening means in alignment with the side opening so that said peening means rotates, reciprocates, and orbits



within the conduit when said mandrel is rotated and said housing is rotated and reciprocated.

4,619,129

METHOD OF AND APPARATUS FOR FORMING BLANKS BY HYDROPLASTIC DEFORMATION

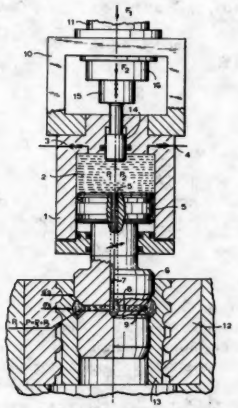
Georgi K. Petkov; Todor S. Todorov; Yordanka R. Atanassova; Nikola M. Netzov; Stefan K. Deevski; Nikola I. Radev; Botyo P. Botev; Georgi M. Metev; Ivan H. Naydenov, and Yakim N. Petrov, all of Gabrovo, Bulgaria, assignors to NPSP po Hydroplastichna Obrabotka na Metalite, Gabrobo, Bulgaria

Filed Nov. 17, 1983, Ser. No. 552,504

Claims priority, application Bulgaria, Jan. 26, 1983, 59472

Int. Cl.[4] B21D *26/02*

U.S. Cl. 72—56 **4 Claims**



1. A method of deforming blanks by hydroplastic deformation, comprising supplying a working fluid under periodically varying high, material deforming pressure as a concentrated fluid load to a closed deformation space, said deformation space being partially bounded by a part of the surface of the blank which is momentarily to be deformed, and progressively varying the location of the part of the surface of the blank which is to be deformed until all of said surface of the blank has been subjected to hydroplastic deformation.

4,619,130

APPARATUS FOR PROVIDING A RIM ON THE TIPS OF BALLPOINT

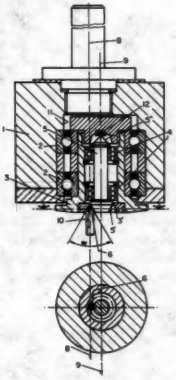
Ugo Buzzi, Arzo, Switzerland, assignor to Buzzi & Co. S.A., Chiasso, Switzerland

Filed Apr. 16, 1985, Ser. No. 723,932

Claims priority, application Switzerland, Apr. 26, 1984, 2039/84

Int. Cl.[4] B21D *41/04*

U.S. Cl. 72—124 **4 Claims**



1. Apparatus for providing a rim on the tips for ballpoint pens even if made of a very hard material, comprising a first body **(1)** rotating about an axis **(8)** which coincides with the axis of the tip **(10)** to be provided with a rim, said body **(1)** being provided with an eccentric hole **(11)** about whose axis **(9)** a second body **(3)** rotates on first rolling means **(2)**, in said second body **(3)** a pivot **(5)** rotates by means of second rolling means **(4)** supported on the inside of said second body **(3)**, said pivot **(5)** being provided on its inner end **(5")** with pushing means **(12)** and on its outer end with a first convergent conical surface **(5')** which presses directly on the edge **(6)** of the tip to be provided with a rim with the aid of a second diverging conical surface **(3')** joined to said second body **(5)** and such as to constitute, together with the first surface **(5')** the angle α which is most suitable for providing a rim on the edge **(6)** of the tip **(10)** to be provided with a rim.

4,619,131

METHOD FOR BENDING SHEETS

Hans Zeman, Donaustrasse 23, Maria Enzersdorf-Südstadt, Austria

PCT No. PCT/AT80/00023, § 371 Date Feb. 26, 1981, § 102(e) Date Feb. 26, 1981, PCT Pub. No. WO81/00222, PCT Pub. Date Feb. 5, 1981

Continuation of Ser. No. 243,942, Feb. 26, 1981, abandoned. This PCT application Jul. 7, 1980, Ser. No. 580,773

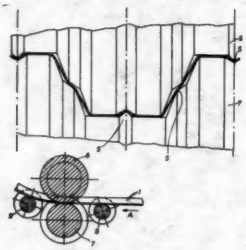
Claims priority, application Austria, Jul. 10, 1979, 4815/79

Int. Cl.[4] B21D *5/08*

U.S. Cl. 72—173 **2 Claims**

1. A process for bending a sheet metal element into an elongated self-supporting sheet metal construction panel, having inside and outside surfaces, a longitudinal axis and a transverse sectional shape continuous in the direction of the longitudinal axis, said transverse sectional shape comprising at least one trapezium section having rectilinearly arranged walls forming inner and outer beams and webs connecting the beams with the

webs forming nonparallel walls and a web connecting an inner and outer beam, the height of the trapezium section being the distance between an inner and an outer beam, comprising the steps of providing a pair of rolls including a stationary roll and an adjustable roll, and at least one adjustable bending roll disposed in front or behind said pair of rolls, each of said rolls having a profile surface which corresponds to the sectional shape of the sheet metal, feeding said panel through said rolls and bending said sheet metal panel, from one end to the other



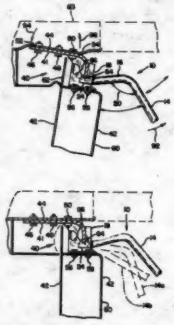
in its longitudinal direction to bend, the beams and webs of said panel continuously about an axis normal to the height of said trapezium section thereby placing said sheet metal element in compressive stress, and simultaneously forming continuous longitudinal beads within said panel parallel to said longitudinal axis between those beams and webs in which the bending occurs by said pair of rolls and where upsetting of material subjected to compressive stress occurs, existing beads in any of those beams and webs being enlarged and reinforced in a form-locking manner.

4,619,132

DOOR HINGE ALIGNING TOOL

Gerald McBee, 793 West Tamarack, Hermiston, Oreg. 97838

Division of Ser. No. 512,792, Jul. 25, 1983, Pat. No. 4,555,929.
This application Aug. 26, 1985, Ser. No. 769,429
Int. Cl.[4] B21J *13/08*
U.S. Cl. 72—458 **5 Claims**



1. A vehicle door aligning tool for use in repairing a sprung vehicle door on a hinge supported on a vehicle frame by a hinge mount having a vertically extending flange portion of a fixed width and with an exposed margin of the flange spaced closely to an adjacent inner periphery of the door, the tool comprising:

an elongated handle member; and

a generally J-shaped head member connected to an end of the handle member, the head member including:

a flat member of a first length (**74**) integrally connected on one side to the end portion of the handle member;

a base member connected to an end of the flat member and extending normal to the flat member away from the end portion; and

a terminal hook member of a second length (**76**) shorter than the first length connected to the base member at a position spaced from the flat member and extending parallel thereto so as to define the J-shape of the head member and a channel in the head member having a length extending normal to the end of the handle member and opening in a first direction radial of the handle member for engaging the margin of the flange portion of the vehicle door hinge mount in the channel;

the hook member having a frontal face spaced at a spacing (**90**) across the channel to the flat member of between 0.6 and 0.7 inches so as to clear a hinge pin in the hinge mount when the head member is fitted onto the exposed margin of the hinge mount;

said second length of hook member being less than one-half the first length such that the hook member can be inserted between the flange portion of the hinge mount and an adjacent portion of the door without removing the door;

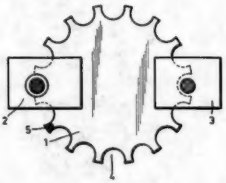
the handle member being angled in a second direction opposite the first direction so as to extend laterally behind an open door of a vehicle to enable inserting said head member between the door and door frame for engaging the hinge mount and to enable a user to move the handle member toward the vehicle to pry the hinge mount in the direction of closure of the vehicle door and thereby to realign said door with its frame when sprung.

4,619,133

SYSTEM FOR CHECKING INSPECTION MACHINES

Ralf-Dieter Kautz, Bochum, and Rolf Stapelmann, Castrop-Rauxel, both of Fed. Rep. of Germany, assignors to Holstein und Kappert GmbH, Wambel, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,330
Claims priority, application Fed. Rep. of Germany, Aug. 26, 1983, 3330817
Int. Cl.[4] G01C *25/00*
U.S. Cl. 73—1 R **8 Claims**



1. A system for checking the operational accuracy of an inspection machine, such as a bottle inspection machine, comprising at least one inspection head, and a rotatable star wheel having spaced bottle holding pockets for conducting bottles past said at least one inspection head, wherein the improvement comprises at least one checking part is arranged relative to said star wheel for movement with said star wheel during normal operation for effecting an automatic checking of the operational accuracy of said at least one inspection head, said holding pockets in said star wheel are located in angularly spaced relation around the circumferential periphery of said star wheel, and said at least one checking part is located in said star wheel at the circumferential periphery thereof and between adjacent said bottle pockets.

4,619,134
TESTING DEVICE FOR FLOW METERS

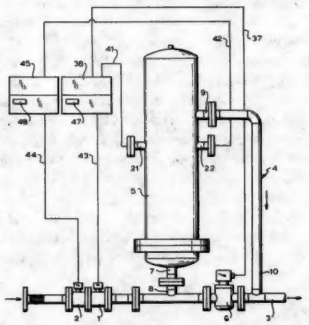
Jürgen Böhm, Mannheim-Wallstadt, Fed. Rep. of Germany, and Charles A. Schad, Tulsa, Okla., assignors to Bopp & Reuther GmbH, Mannheim, Fed. Rep. of Germany

Filed May 25, 1984, Ser. No. 614,732

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347695

Int. Cl.⁴ G01F *25/00*

U.S. Cl. 73—3 **10 Claims**



1. A device for testing at least one flow meter installed in a pipeline, comprising means coupled to the flow meter for delivering pulses indicative of the rate of flow of a liquid in the pipeline, a switch-over valve arranged in the pipeline downstream of the flow meter, a by-pass conduit bridging the switch-over valve, a calibration container having an inlet and an outlet connected one after the other in said by-pass conduit, a measuring piston provided in said calibration container for movement between a starting position close to said inlet and a terminal position close to said outlet of the container, a first signal releasing ring mounted on the measuring piston, a signal generator installed in the wall of the calibration container between said inlet and outlet, a second signal releasing ring arranged on the measuring piston at a fixed distance from said first releasing ring, the fixed distance being such that when multiplied by the inner cross-section of the calibration container it determines the calibration volume of the measuring path of the measuring piston, said signal generator cooperating with said first and second signal releasing rings in such a manner that when said second signal releasing ring reaches the level of the signal generator the latter produces a start signal and when the first signal releasing ring reaches the signal generator the latter produces a stop signal for a measuring cycle, and evaluation means connected to said means for delivering pulses from said flow meter, said evaluation means being connected to said signal generator for counting the pulses from the flow meter in response to said start signal and for comparing the count with the calibration volume in response to said stop signal.

4,619,135
APPARATUS AND METHOD FOR CALIBRATING ENVIRONMENT CONTROL SYSTEMS

Jack D. Nunn, 802 E. 28th St., Houston, Tex. 77009

Filed Oct. 16, 1984, Ser. No. 661,360

Int. Cl.⁴ G01L *27/00*

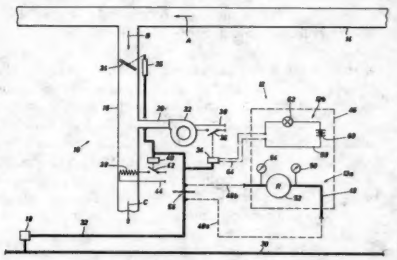
U.S. Cl. 73—4 R **8 Claims**

1. Apparatus for calibrating environment control equipment comprising:

a. a fluid pressure system, including a fluid pressure line having a first end and a second end opposite thereto, and connected in series along said fluid pressure line a first gauge toward said first end, a regulator and a second gauge toward said second end; and

b. detector circuit means for detecting the opening and closing of electrical switches as part of said control equipment, including a power source, indicator means, and means for connecting said circuit, in series, with such an electrical switch whose condition is to be determined;

c. wherein said first and second ends of said fluid pressure system may be interposed in a fluid pressure control line as part of said environment control equipment so that said first and second gauges and said regulator are connected in series with said control line, and said means for connecting said detector circuit means may be connected across a switch whose condition is to be determined, whereupon said first gauge may determine the fluid pressure provided in the control line of the environment control equipment, and the regulator may be selectively adjusted to provide fluid pressure to one or more environment control equipment components to be regulated by fluid pressure in said control line and including said switch so that selected pressure may be so applied to such components and their configurations appropriately adjusted to cause such components to operate in response to selected pressures applied thereto along said control line.



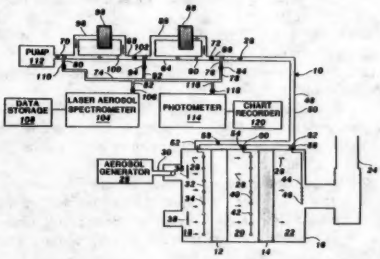
4,619,136
APPARATUS FOR MEASURING THE DECONTAMINATION FACTOR OF A MULTIPLE FILTER AIR-CLEANING SYSTEM

John P. Ortiz, Santa Fe, N. Mex., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Jul. 3, 1985, Ser. No. 751,412

Int. Cl.⁴ G01N *15/08*

U.S. Cl. 73—38 **11 Claims**



1. An apparatus for measuring the overall decontamination factor of first and second filters, the first and second filters being located in a plenum having an upstream chamber, an intermediate chamber, and a downstream chamber, the first filter being located between the upstream and intermediate

chambers and the second filter being located between the intermediate and downstream chambers, said apparatus comprising:

a. an aerosol generator for producing a challenge aerosol composed of individual particles, said aerosol generator being in fluid communication with the upstream chamber;

b. an upstream collector for collecting said challenge aerosol before said challenge aerosol enters the first filter, said upstream collector being disposed in the upstream chamber;

c. an intermediate collector for collecting said challenge aerosol that passes through the first filter, said intermediate collector being disposed in the intermediate chamber;

d. a downstream collector for collecting said challenge aerosol that passes through the second filter, said downstream collector being disposed in the downstream chamber;

e. a first conduit for providing a path for said challenge aerosol, said first conduit having a main portion, an upstream portion, an intermediate portion and a downstream portion, said main portion being in fluid communication with said upstream, intermediate, and downstream portions, said upstream portion being in fluid communication with said upstream collector, said imtermediate portion being in fluid communication with said intermediate collector and said downstream portion being in fluid communication with said downstream collector;

f. an upstream valve means for controlling the passage of said challenge aerosol through said upstream collector, through said upstream portion and into said main portion, said upstream valve means being disposed in said upstream portion;

g. an intermediate valve means for controlling the passage of said challenge aerosol through said intermediate collector, through said intermediate portion and into said main portion, said intermediate valve means being disposed in said intermediate portion;

h. a downstream valve means for controlling the passage of said challenge aerosol through said downstream collector, through said downstream portion and into said main portion, said downstream valve means being disposed in said downstream portion;

i. a dilution conduit for providing a path for said challenge aerosol, said dilution conduit having entry, middle, and exit portions, said dilution entry portion being in fluid communication with said main portion;

j. a first valve means for controlling the passage of said challenge aerosol through said dilution entry portion, said first valve means being disposed in said dilution entry portion;

k. an analysis conduit for providing a path for said challenge aerosol, said analysis conduit having entry, middle, laser, and exit portions, said analysis entry portion being in fluid communication with said main portion and said analysis exit portion being in fluid communication with said dilution exit portion;

l. a second valve means for controlling the passage of said challenge aerosol through said analysis entry portion, said second valve means being disposed between said analysis entry portion and said analysis middle portion;

m. a first dilution stage for diluting said challenge aerosol, said first dilution stage being disposed between and in fluid communication with said dilution entry portion and said dilution middle portion;

n. a transverse conduit for providing a path for said challenge aerosol between said dilution middle portion and said analysis middle portion, said transverse conduit being in fluid communication with said dilution middle portion and said analysis middle portion;

o. a third valve means for controlling the passage of said challenge aerosol through said transverse conduit, said third valve means being disposed in said transverse conduit;

p. a second dilution stage for further diluting said challenge aerosol, said second dilution stage being disposed between and in fluid communication with said dilution middle portion and said dilution exit portion;

q. a fourth valve means for controlling the passage of said challenge aerosol through said second dilution stage, said fourth valve means being disposed in said dilution middle portion;

r. a laser aerosol spectrometer for detecting said individual particles, said laser aerosol spectrometer being in fluid communication with said laser portion, said laser portion providing a path for said challenge aerosol between said analysis middle portion and said laser aerosol spectrometer, said laser portion being in fluid communication with said analysis middle portion;

s. a fifth valve means for controlling the passage of said challenge aerosol through said laser portion, said fifth valve means being disposed in said laser portion;

t. a sixth valve means for controlling the passage of said challenge aerosol between said analysis middle portion and said analysis exit portion, said sixth valve means being disposed between said analysis middle portion and said analysis exit portion; and

u. a pump for facilitating the movement of said challenge aerosol within said apparatus, said pump being connected to and in fluid communication with said dilution exit portion.

4,619,137

ARRANGEMENT OF A PRESSURE-MEASURING ELEMENT

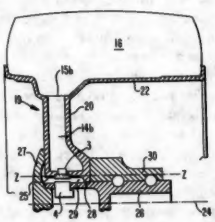
Helmuth Bott, Pforzheim, Fed. Rep. of Germany, assignor to Dr. Ing. h.c.F. Porsche, Aktiengesellschaft, Fed. Rep. of Germany

Filed May 24, 1985, Ser. No. 737,436

Claims priority, application Fed. Rep. of Germany, May 26, 1984, 3419820

Int. Cl.[4] B60C *23/04*

U.S. Cl. 73—146.5 **1 Claim**

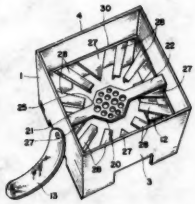


1. An arrangement of a pressure-measuring element for an air pressure control system on a vehicle wheel having a rim, in which the measuring element is acted upon by air pressure in the hollow space of the tire and cooperates with a fixedly arranged pick-up means, an air chamber means provided on the rim side which is in communication with the tire hollow space by way of at least one air through-flow opening means, the pressure-measuring element being arranged in a closure wall of the air chamber means, said closure wall extending at least approximately parallelly with respect to one of fixed wheel hub and wheel axis of rotation, the pick-up means being held in the fixed wheel hub disposed opposite the measuring element, and an annular space separating the pick-up means from the measuring element, said annular space being closed-off between the stationary hub and the closure wall by way of an inner sealing means at the wheel and by way of a cap means adapted to be mounted from the outside.

4,619,138
AIRFLOW MEASUREMENT SHROUD

Buford Ohnhaus, 9925 Lorelei NE., Albuquerque, N. Mex. 87111

Filed Dec. 19, 1984, Ser. No. 683,403
Int. Cl.⁴ G01F *15/00*
U.S. Cl. 73—198 **7 Claims**



1. Airflow measurement shroud comprising:

a substantially straight length of duct having imperforate wall means open at both ends and having a central axis;

means for seating and holding a portable airflow meter at a first end of said duct length in a position crossing the center of the cross-section of said duct, said meter having at least one measurement orifice, said position exposing a measurement orifice of said meter near said center of said cross-section;

end cutouts on opposite sides of said duct at said first end of said duct length, facing each other across said duct in a direction transverse to the seating of said airflow meter across said duct;

a central first baffle substantially perpendicular to said duct axis for breaking up central airflow jets, said first baffle having at least three apertures therethrough providing at least 30% open area, said baffle covering not more than one-ninth nor less than one-twenty-fifth of the cross-section of said duct and supported on said duct wall means so as to be located within said duct in the neighborhood of a second end of said duct length which is the opposite end thereof with respect to said first end thereof;

a multimember second baffle leaving open a central cross sectional area in said duct, located between said first baffle and said means for seating and holding said airflow meter, having members at fixed locations on said wall means substantially on a plane transverse to said axis distributed around said wall means and extending obliquely towards said axis with a component of direction towards said first baffle; and

a third multimember baffle leaving open a central cross-sectional area in said duct, located between said first baffle and said means for seating and holding said airflow meter, having members fixed at locations on said wall means substantially on a lane transverse to said axis distributed around said wall means and extending obliquely towards said axis with a component of direction towards said means for seating said airflow meter.

4,619,139
FLOW METER WITH DISPLACEABLE FLOW RATE INDICATOR

Lars O. Rosaen, Hazel Park, Mich., assignor to Universal Flow Monitors, Inc., Hazel Park, Mich.

Continuation-in-part of Ser. No. 633,649, Jul. 23, 1984. This application Jan. 4, 1985, Ser. No. 688,907
Int. Cl.⁴ G01F *1/22*
U.S. Cl. 73—198 **17 Claims**

1. A fluid flow meter comprising:

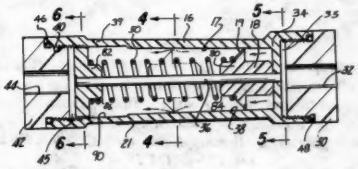
a housing comprising a peripheral wall defining an elongated hollow chamber therein and having a fluid inlet at a first end of said chamber and fluid outlet at a second end of said chamber; said peripheral wall including at least a wall portion thereof formed of a visually transparent material;

a chamber wall located in said housing and formed across one of said ends of said chamber, said chamber wall including at least one aperture therethrough;

a support body located in said housing and retained adjacent the other of said ends of said chamber, said support body including at least one aperture therethrough;

a rod extending between and mounted to each of said chamber wall and said support body;

a piston including a piston portion defining a linear peripheral demarcation aligned in profile perpendicularly to a longitudinal axis of said chamber; said piston also including a bore slidably receiving said rod therein, such that said piston is displaceably carried by said rod in a position so that said demarcation is visible through said transparent



portion of said peripheral wall, and said piston portion circumferentially abuts against said peripheral wall, at said first end of said chamber; and

means for resiliently biasing said piston towards said first end of said chamber;

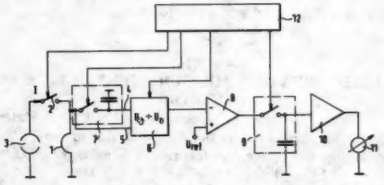
wherein said peripheral housing wall includes a first inner surface tapering radially outwardly from said first chamber end, and a second inner surface adjacent said support body and between said support body and said chamber wall which is radially outwardly recessed from said first inner surface so as to form a bypass about said piston when the rate of flow exceeds a predetermined rate; and

wherein said peripheral housing wall is imperforate between said chamber wall and said support body, such that said chamber is circumferentially imperforate between said chamber wall and said support body.

4,619,140
CIRCUIT ARRANGEMENT FOR THE ELECTROTHERMAL MEASUREMENT OF LEVEL

Frank Kühnel, Eschborn, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 10, 1984, Ser. No. 659,584
Claims priority, application Fed. Rep. of Germany, Oct. 18, 1983, 3337779
Int. Cl.⁴ G01F *23/24*
U.S. Cl. 73—295 **4 Claims**



1. In an electrical measurement circuit for electrothermal measurement of a level of a liquid by use of a resistance sensor heated by a constant electric current, said measurement circuit including an evaluation circuit for evaluating a measurement voltage which is dependent on a state of immersion of the resistance sensor in the liquid, into which circuit a compensa-

tion voltage is also feedable for compensation of temperature, the improvement comprising

control means for operating said measurement circuit arrangement during a sequence of scanning periods;

means for heating said resistance sensor with a constant current during a heating interval at the start of one of said scanning periods;

means for detecting a measurement voltage from said resistance sensor at the start of the heating interval and at the end of the heating interval;

means coupled to said detecting means for storing a value of the measurement voltage detected at the start of the heating interval to serve as a compensation voltage; and wherein

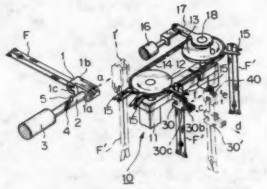
said evaluation circuit includes means for forming a quotient of the measurement voltage, detected at the end of the interval, divided by the compensation voltage during each scanning period.

4,619,141

INSPECTION APPARATUS FOR SLIDE FASTENERS

Keiichi Yoshieda, and Yuusei Sassa, both of Toyama, Japan, assignors to Yoshida Kogyo K.K., Tokyo, Japan

Filed Oct. 3, 1985, Ser. No. 783,667
Claims priority, application Japan, Oct. 17, 1984, 59-216407
Int. Cl.[4] G01M *19/00*
U.S. Cl. 73—865.9 **7 Claims**



1. An apparatus for inspecting slide fasteners comprising:

a slide fastener suspension device having a horizontal rotary member provided with a plurality of equally-spaced clips for supporting each of said slide fasteners in a suspended condition, and a drive means adapted to intermittently rotate said horizontal rotary member;

a first gripper which is provided at a first position along a movement path of said horizontal rotary member and which is adapted to feed in succession said slide fasteners to said clips of said suspension device in a suspended condition; and

a second gripper which is provided at a second position along said path of said horizontally rotating member and which is adapted to remove said slide fasteners from said clips in succession;

said path of said horizontal rotary member between said first position and said second position providing a visual inspection region for said slide fasteners.

4,619,142

EMITTED VIBRATION MEASUREMENT DEVICE AND METHOD

Gary L. Gisler, Glendale, Ariz., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Oct. 3, 1984, Ser. No. 657,310
Int. Cl.[4] G01M *1/16*
U.S. Cl. 73—462 **16 Claims**

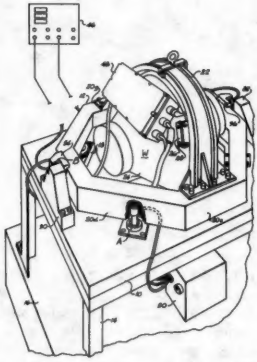
1. A method for measuring the vibrational forces produced by a reaction wheel assembly due to the rotor and bearing components and their imbalance and imperfections comprising:

providing a large mass base;

providing a low mass carriage adapted for carrying said reaction wheel assembly out of contact with said base;

supporting said carriage on said base by means of air bearing supports at locations spaced about said carriage to provide a generally frictionless support of said carriage on said base along vertical axes;

connecting said carriage and base together by means of load



cells at location different from said location of said air bearing supports having a sensing axis in a plane generally parallel to said base so that the only physical coupling between said carriage and base is through said load cells; and

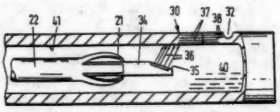
analyzing the signals produced by said load cells to identify the rotor components and bearing components causing the vibrational forces.

4,619,143

APPARATUS AND METHOD FOR THE NON-DESTRUCTIVE INSPECTION OF SOLID BODIES

Ferdinand M. J. Franken, GJ Biervliet, Netherlands, assignor to Dow Chemical (Nederl) B.V., Terneuzen, Netherlands

Filed Aug. 24, 1984, Ser. No. 643,915
Int. Cl.[4] G01N *29/04*
U.S. Cl. 73—598 **11 Claims**



1. An apparatus for nondestructively inspecting a wave transmitting solid, said apparatus comprising in cooperative combination (a) means for generating transverse surface waves in the solid which have sufficiently different frequencies such that they travel at different depths through the solid; (b) means for receiving at least a part of a reflected portion of the surface waves; and a detector means for measuring the reflected portion of at least two surface waves having sufficiently different frequencies such that the reflected portion of these waves indicate the severity of a wave reflective discontinuity in the solid body, said apparatus characterized by utility for discriminating the location of discontinuities in the solid concealed from the surface adjacent the wave generating means.

4,619,144

METHOD OF AND APPARATUS FOR GAS PRESSURE MEASUREMENT BY THE GAS-FRICTION PRINCIPLE

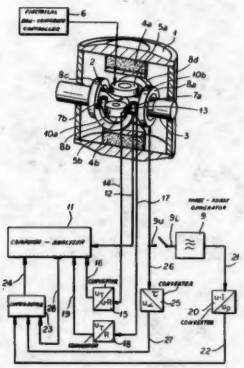
Johan K. Fremery, Bonn; Bernd Lindenau, Jülich, and Klaus Witthauer, Aachen-Vorheide, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich, Jülich and RWD-Datentechnik GmbH, Aachen, both of, Fed. Rep. of Germany

Filed Aug. 19, 1985, Ser. No. 767,170

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431517

Int. Cl.[4] G01L *19/04*

U.S. Cl. 73—708 **6 Claims**



1. In a process for measuring the pressure in a gas with a gas-friction vacuum meter, in which a rotating body is suspended contact-free in a magnetic field in a measuring head between a plurality of drive coils, said rotating body being set in rotation with the aid of said drive coils and being maintained in said rotation at a rotation frequency above a given predetermined minimum rotation frequency, wherein a decrease of the rotational speed of said rotating body occurring as a result of gas friction is compensated by energization of said drive coils with changes of current flow in said drive coils made by a three-phase generator, and with at least one rotation speed sensor arranged in said measuring head, which detects and responds to said rotational frequency of said rotating body, and the sensor output signals from said rotation speed sensor are transmitted to an electronic analyzer unit, which ascertains from the timely change of said rotational frequency said pressure of said gas surrounding said rotating body, the improvement which comprises feeding to said electronic analyzer unit a temperature signal representing the temperature of said gas surrounding said rotating body in such a way that the measurement of said pressure of said gas is corrected for the influence of heat transferred to said gas by the operation of said rotating body.

4,619,145

APPARATUS FOR MONITORING SOLIDS FEED, DRY SOLIDS FLOW

Russell S. Girgenti, So. Hamilton, Mass., assignor to Auburn International, Inc., Danvers, Mass.

Filed Oct. 9, 1984, Ser. No. 658,585

Int. Cl.[4] G01F *1/74*

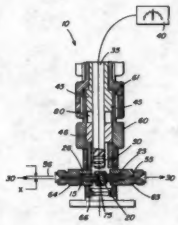
U.S. Cl. 73—861.04 **3 Claims**

1. A non-intrusive apparatus for detecting dry solids flow, having a critical flow cross section of less than 0.2 square inches, comprising:

means defining a critical flow path including a friction sensitive electrode with a bore and a first means for insulating the electrode from electrical interference;

means defining an exterior flow path communicating with said critical flow path; and,

electrode lead and readout means communicating with the friction sensitive electrode means for monitoring charge transfer created by friction within the friction sensitive electrode, said electrode lead including a second means for insulating the electrode from electrical interference;



and wherein said electrode lead means further includes an electrically conductive spring communicating with said friction sensitive electrode, said spring adapted to absorb any force applied to the first insulating means during alignment.

4,619,146

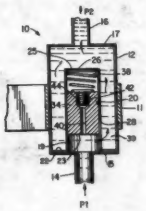
FLOW METER

Ionel E. Teodorescu, Rego Park, N.Y., and William Banko, 1496 Mayflower Ave., Bronx, N.Y. 10461, assignors to William Banko, Bronx; Henry E. Allen, Mamaroneck and Morris H. Shamos, Bronx, all of, N.Y.

Filed May 22, 1981, Ser. No. 266,622

Int. Cl.[4] G01F *1/24*

U.S. Cl. 73—861.54 **15 Claims**



1. A fluid flow meter comprising:

a housing;

a hollow cylinder within said housing said cylinder having a slot therein;

a piston located within said cylinder, said piston having magnetic properties;

inlet means for conveying a fluid having a flow to be measured into said housing to one end of said cylinder, the fluid moving the piston within said cylinder independent of gravity and spatial orientation to locations related to its flow and exiting through the slot;

outlet means for conveying fluid exiting from the slot out of the housing; and

a Hall effect transducer fixed in a position for producing an electrical signal corresponding to the position of the moving piston in said cylinder.

4,619,147
LOAD CELL HAVING FLAMEPROOF FUNCTION

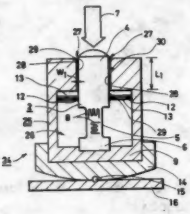
Shigeo Yoshimura, Kawanishi; Yoshiaki Shimada, and Hitoshi Kimura, both of Nara, all of Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Sep. 10, 1984, Ser. No. 648,894

Claims priority, application Japan, Nov. 21, 1983, 58-180805[U]; Nov. 21, 1983, 58-220008; Nov. 29, 1983, 58-226610; Nov. 29, 1983, 58-226611; May 15, 1984, 59-97908; May 15, 1984, 59-97909

Int. Cl.[4] G01L *1/26, 1/22*

U.S. Cl. 73—862.38 **18 Claims**



1. A load cell having a flame proof function, comprising: a load cell body including a fixed mounting portion, a load/electric signal converting portion for converting a load into an electric signal, and a load receiving portion connected with said load/electric signal converting portion of said load cell body for receiving said load and transmitting the same to said load/electric signal converting portion in a predetermined load direction; flame proof enclosure means directly and exclusively containing said load cell body and having an opening for outwardly exposing said load receiving portion and for permitting free movement of said load receiving portion in said opening, said fixed mounting portion of said load cell body being secured to said enclosure means; said load cell body having a first surface in the vicinity of said opening of said enclosure means, said first surface having a predetermined length, and said opening of said enclosure means having a second surface facing said first surface and extending along a length corresponding at least to said predetermined length, said first and second surfaces extending substantially in parallel to each other, said first and second surfaces being spaced from each other for defining a predetermined gap between said first and second surfaces, said gap having a predetermined gap width and a gap length corresponding to said length of said second surface, said gap width and said gap length being selected to keep energy of an explosion caused in said enclosure means within the interior of the enclosure means for preventing a flame propagation out of said enclosure means.

4,619,148
ELECTROMECHANICAL APPARATUS FOR CONVERSION OF FORCE TO ELECTRIC SIGNAL

Sándor Kovács, Budapest, Hungary, assignor to Vasipari Kutato es Fejleszto Vallalat, Hungary

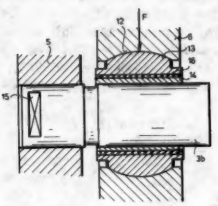
Filed Apr. 9, 1984, Ser. No. 598,501

Claims priority, application Hungary, Apr. 7, 1983, 1206/83

Int. Cl.[4] G01L *1/04*

U.S. Cl. 73—862.62 **6 Claims**

1. Electromechanical apparatus for the conversion of a force to an electric signal comprising a member for receiving a force (F) to be measured, measuring sensors (3A, 3B, 3C) each having a member for transferring a reaction force, fitting surfaces formed between the member for receiving the force (F) to be measured and the measuring sensors (3A, 3B, 3C) for allowing multi-directional displacement, said member for transferring the reaction force is rigidly clamped, characterized in that said multi-directional displacement includes axial displacement and the fitting surfaces allowing axial displacement are formed as the outer surfaces of a shaft and inner surfaces of a bushing (14)



and an insert (13) in each of the measuring sensors (3A, 3B, 3C).

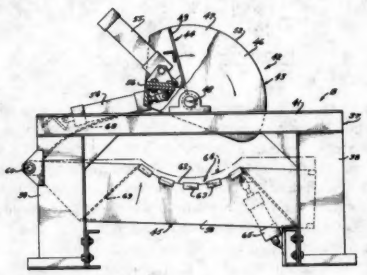
4,619,149
BELT CONVEYOR CROSS-STREAM SAMPLING SYSTEM

John B. Long, 421 Heron Hill Dr., Louisville, Tenn. 37777

Filed Jan. 2, 1985, Ser. No. 688,394

Int. Cl.[4] G01N *1/12, 1/20*

U.S. Cl. 73—863.91 **14 Claims**



1. In combination with a belt conveyor having a conveyor belt for conveying bulk material disposed thereon and drive means for said belt, sample taking means movable across said conveyor belt for removing a cross-stream increment of bulk material therefrom, said sample taking means including plate means for segregating therebetween a cross-stream increment of bulk material as disposed on said conveyor belt and impeller means for removing the thus segregated cross-stream increment of bulk material from said conveyor belt, and contour means for modulating the normal troughing of said conveyor belt and supporting and conforming said conveyor belt to the operative course of said sample taking means as it moves across said conveyor belt.

4,619,150
SLIDING GEAR FOR SPEED-CHANGING TRANSMISSION

Pedro Wiggenhauser, Hagnau, Fed. Rep. of Germany, assignor to Zahnradfabrik Friedrichshafen Aktiengesellschaft, Friedrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 652,145, Sep. 17, 1984, abandoned, which is a continuation of Ser. No. 249,692, Mar. 31, 1981, abandoned. This application Aug. 19, 1985, Ser. No. 767,241

Claims priority, application Fed. Rep. of Germany, Apr. 2, 1980, 3012778

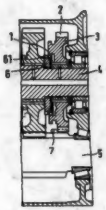
Int. Cl.[4] F16H *3/04, 3/38, 57/00*

U.S. Cl. 74—332 **3 Claims**

1. In a speed-changing transmission including a driving gear,

an output shaft arranged for rotation in a first sense under the action of said driving gear, a sliding gear freely rotatably and axially displaceably mounted on said output shaft and having a set of peripheral running teeth which extend substantially radially outwardly of said sliding gear and are in permanent mesh with said driving gear, said sliding gear being further provided with a set of peripheral first clutch teeth and a coupling member fixedly mounted on said output shaft and having a set of peripheral second clutch teeth adapted to be in meshing engagement with said first clutch teeth upon an axial shift of said sliding gear along said output shaft into an engagement position in which said output shaft is rotated by said driving gear in a second sense opposite to said first sense through the intermediary of said sliding gear and said coupling member;

the improvement comprising said first clutch teeth extend between a pair of axially spaced annular surfaces formed on a sleeve constituting part of said sliding gear and into which said coupling member fits and said first clutch teeth project substantially radially inwardly of said sliding gear, said second clutch teeth extend between a pair of axially spaced faces of a disk forming said coupling member and project substantially radially outwardly of said coupling



member, said first clutch teeth being formed within said sleeve, and said running teeth and said first clutch teeth have respective centerlines including with the axial direction of said sliding gear respective acute angles of inclination β_L and β_K substantially satisfying the expression

$$\beta_K = \arctan (r_K / r_L \tan \beta_L)$$

where r_K and r_L are the effective radii of said first clutch teeth and said running teeth, respectively, and said acute angles of inclination are of the same sign, whereby axial forces exerted under load upon said running teeth and upon said first clutch teeth in said engagement position of said sliding gear substantially cancel each other under both "push" and "pull" operating conditions in both senses of rotation of said output shaft, each of said first clutch teeth further having its flanks diverging by back angles $\rho < \beta_K$ of opposite signs from the center line of that first clutch tooth in the direction of said axial shift of said sliding gear into said engagement position of the latter, thereby to maintain said first clutch teeth securely engaged with said second clutch teeth, said flanks including with the centerlines of said clutch teeth back angles of opposite signs ranging between 1.5° and 6°.

4,619,151

TWO SPEED AXLE SHIFT ACTUATOR

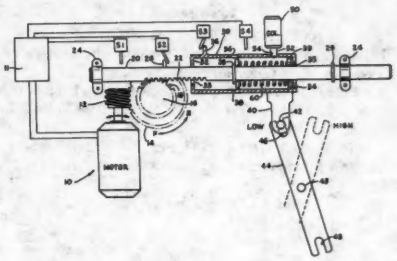
Edward G. Trachman, Birmingham, and Daniel W. Roper, Rochester, both of Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1985, Ser. No. 725,270

Int. Cl.[4] G05G *3/00, 17/00;* F03G *1/10*

U.S. Cl. 74—335 **9 Claims**

1. Reversible shifting apparatus for a two-speed axle comprising an axle unit shifting arm, a slidable spring cage connected to the shifting arm, a slidable shaft extending through the slidable spring cage, a spring surrounding said shaft in position within the cage, means fixed on the shaft at spacial part locations for compressing the spring against abutment means at opposite ends of the cage and the shaft is slid through the cage, reversible drive means connected to the shaft for



driving the shaft through the cage, first locking means for locking the cage in predetermined position and second locking means for locking the shaft in predetermined position.

4,619,152

TRANSMISSION OPERATING DEVICE

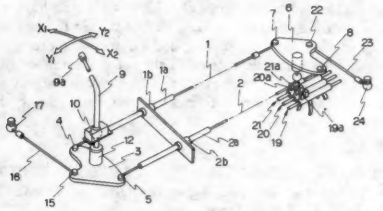
Kazuhiro Suzuki, Nishinomiya, Japan, assignor to Nippon Cable System, Inc., Takarazuka, Japan

Filed Aug. 26, 1985, Ser. No. 768,999

Claims priority, application Japan, Sep. 18, 1984, 59-195373; Oct. 17, 1984, 59-217879

Int. Cl.[4] G05G *9/16*

U.S. Cl. 74—473 R **7 Claims**



1. A transmission operating device constructed so as to perform a shifting operation and a selecting operation of a transmission by pushing or pulling two inner wires of two control cables arranged parallel to each other, comprising:

(a) a change speed lever being supported so as to be operated in two directions perpendicular to each other and not to rotate around the axis of the lever;

(b) a connecting arm with which the two inner wires are conneced at both ends of the arm; and

(c) a cylindrical casing provided at a middle point between the two points where the two inner wires are connected with the connecting arm,

wherein the change speed lever is perpendicularly provided to the connecting arm by rotatably inserting a lower portion of the change speed lever into the cylindrical casing, the connecting arm is made to move in the direction that the inner wires are pushed or pulled by operating the change speed lever in one direction and is made to swing in the direction perpendicular to the direction that the inner wires are pushed or pulled by operating the change speed lever in the other direction perpendicular to the one direction, and the connecting arm has a rotational center so that the swinging motion of the connecting arm in the direction perpendicular to the direction that the inner wires are pulled or pushed is changed into a motion that the connecting arm rotates around the rotational center in

a plane substantially parallel to the two inner wires of the two control cables.

4,619,153

VEHICLE TRANSMISSION

Jean J. Lasoen, Villepreux, France, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands

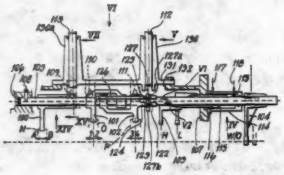
PCT No. PCT/EP84/00067, § 371 Date Nov. 2, 1984, § 102(e) Date Nov. 2, 1984, PCT Pub. No. WO84/03668, PCT Pub. Date Sep. 27, 1984

PCT Filed Mar. 8, 1984, Ser. No. 672,330

Claims priority, application United Kingdom, Mar. 15, 1983, 8307096

Int. Cl.[4] G05G *5/10, 9/12*

U.S. Cl. 74—477 **7 Claims**



1. A vehicle transmission having a housing a multi-ratio main change speed gear set and a first range change gear set in series within the housing, selector forks for effecting speed and range changes in the transmission, a single selector fork rail on which the selector forks are mounted for axial sliding movement, rail support means and rail fastening means for supporting and fastening the rail in a stationary position within the housing and also supporting the rail for axial sliding within the housing on release of the fastening means, and an access aperture in the housing whereby, after release of the rail fastening means, the selector forks can be removed one by one from one end of the rail via the aperture on sliding of the rail within the housing.

4,619,154

CHOKE LEVER DEVICE FOR A MOTOR VEHICLE

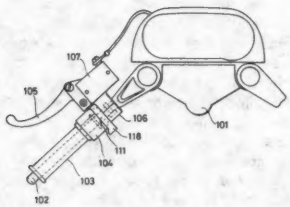
Isao Yamanaka, Saitama, Japan, assignor to Honda Giken Kogyo K.K., Tokyo, Japan

Continuation of Ser. No. 419,277, Sep. 17, 1982, Pat. No. 4,526,056. This application May 20, 1985, Ser. No. 735,517

Claims priority, application Japan, Sep. 19, 1981, 56-148147

Int. Cl.[4] G05G *13/00*

U.S. Cl. 74—489 **4 Claims**



1. A choke adjustment lever device for a motor vehicle having a handle pipe, the improvement comprising,

a fixed handle grip fixed on said handle pipe near one end thereof,

an adjustable choke assembly having a choke lever and rotatably mounted on said handle pipe upstream of said fixed grip sufficiently near said fixed grip to permit operator thumb engagement with said choke lever while grasping said fixed grip as a fixed pivot point, wherein an adjusting amount of said choke lever increases by rotating said choke lever about said handle grip,

a switch housing mounted on said handle pipe between the upstream end of said fixed grip and said adjustable choke assembly,

and a lever positioned near said handle grip.

4,619,155

RACK AND PINION STEERING DEVICE

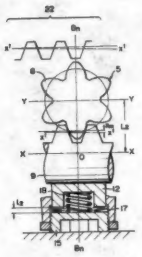
Takeshi Futaba, Yao, Japan, assignor to Koyo Jidoki Kabushiki Kaisha, Nara, Japan

Filed Apr. 15, 1983, Ser. No. 485,178

Claims priority, application Japan, Apr. 15, 1982, 57-61712; Oct. 6, 1982, 57-174668

Int. Cl.[4] F16H *1/04*; B62D *1/20, 5/06*

U.S. Cl. 74—498 **9 Claims**

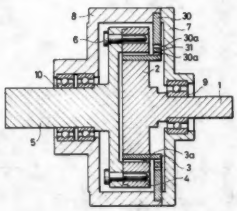


1. A rack and pinion device comprising: a gear housing; a pinion rotatably supported within said gear housing and connected during use of the device to a steering shaft of a vehicle; a rod-like rack connected during use of the device to a steering lever mechanism of the wheels of the vehicle, said rack having a lengthwise axis and having a group of rack teeth meshed with said pinion; and a spring device in contact with the back of said rack on the side opposite said pinion to resiliently bias said rack against said pinion; wherein said group of rack teeth includes, in symmetrical relation on opposite sides of the lengthwise center thereof, a first rack teeth portion near to and a second rack teeth portion far from said center respectively, said second rack teeth portion having a reference pitch line which is inclined so as to approach the lengthwise axis of said rack in a direction extending away from the adjacent first rack teeth portion to enable said rack to undergo flexure displacement in response to a bending pressure exerted thereon by said spring device, said spring device comprises a cylinder connected to said gear housing, said cylinder having an axis perpendicular to the axis of said pinion and defining a cylinder space which is open at one end to said rack, an end member for closing the other end of said cylinder space, a plunger slidably mounted within said cylinder space and having one end thereof in frictional engagement with the back of said rack, and first and second springs retained between said plunger and said end member to resiliently bias said plunger against said rack, and wherein the effective distance through which said first spring acts is relatively small with respect to the effective distance through which said second spring acts so that if an amount of flexure displacement in said rack is less than a predetermined value, the resultant pressure of said first and second springs is applied to said rack whereas if the amount of flexure displacement exceeds a predetermined value, only the pressure of said second spring is applied to said rack.

4,619,156
HARMONIC GEAR APPARATUS

Yuichi Kiryu, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 10, 1984, Ser. No. 659,477
Claims priority, application Japan, Oct. 26, 1983, 58-202085
Int. Cl.[4] F16H *37/04*
U.S. Cl. 74—640 3 Claims



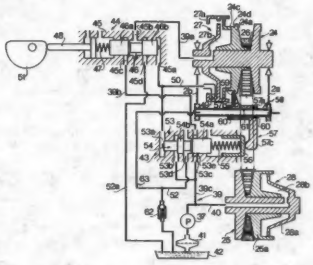
1. A harmonic gear apparatus, comprising;
a circular spline of a cylindrical configuration and having a plurality of teeth on an inner periphery thereof;
a flexible spline of cylindrical configuration disposed within said circular spline and having a plurality of teeth on an outer periphery thereof which are engagable with said teeth of said circular spline, the number of teeth on said flexible spline being smaller than the number of said teeth on said circular spline;
a rotary shaft;
flexion generating means fixed to said rotary shaft and disposed within said flexible spline in contact with an inner periphery thereof, said flexion generating means operating to sequentially engage the teeth of said flexible spline with the teeth of said circular spline upon rotation of said rotary shaft; and
an annular flexible supporting member acting essentially as a stator and being connected to a housing of said harmonic gear apparatus, said supporting member supporting one axial end of said flexible spline in a manner such that said flexible spline is relatively freely flexible in a radial direction but relatively rigid in a circumferential direction, said flexible supporting member comprising a disk element having a first radial end attached to said housing and a second radial end connected to said flexible spline, said second radial end comprising a first annular portion connected to said flexible spline, and at least one second annular portion connected to said first annular portion by means of a set of bridging elements, said bridging elements comprising radially extending connecting portions arranged in a circumferential array.

4,619,157
SYSTEM FOR DETECTING THE TRANSMISSION RATIO IN AN INFINITELY VARIABLE TRANSMISSION

Yasuhito Sakai, Higashimurayama, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 18, 1984, Ser. No. 682,881
Claims priority, application Japan, Dec. 21, 1983, 58-242828
Int. Cl.[4] F16H *11/06*
U.S. Cl. 74—689 1 Claim

1. An improved system for detecting the transmission ratio in an infinitely variable transmission for transmitting the power of an internal combustion engine, the transmission comprising a primary pulley having a hydraulically shiftable disc and a hydraulic cylinder for shifting the disc, a secondary pulley having a hydraulically shiftable disc and a hydraulic cylinder for operating the disc of the secondary pulley, a belt engaged with both pulleys, a hydraulic circuit having a pump for supplying oil, a transmission ratio control valve responsive to engine speed for controlling the oil and for shifting the disc of the primary pulley to change the transmission ratio, and a pressure regulator valve having a spool responsive to the transmission ratio for increasing the line pressure of the hydraulic circuit with an increase of the transmission ratio, and a spring held by a retainer for urging the spool in a direction, wherein the improvement comprises:
a sensor slidably mounted on a guide tube so as to move in parallel with the axial direction of the primary pulley;

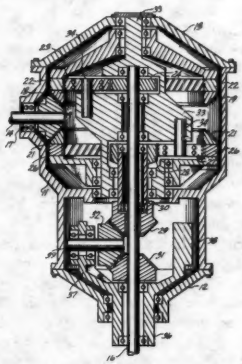


the sensor having a sensor head engaged with the disc of the primary pulley and an arm engaged with the retainer so as to shift the spool in dependency on the movement of the disc of the primary pulley to control the line pressure; and
a lubricating system comprising passages provided in the guide tube and the sensor so as to communicate a part of the hydraulic circuit with an end opening of the passage of the sensor for lubricating contact surfaces of the head of the sensor and the disc of the primary pulley.

4,619,158
BALANCED STEERABLE TRANSMISSION

Donald F. Nelson, 7560 Kentwood Ct., Gilroy, Calif. 95020

Continuation of Ser. No. 153,177, May 27, 1980, abandoned.
This application Feb. 3, 1983, Ser. No. 463,479
Int. Cl.[4] F16H *37/08*
U.S. Cl. 74—695 4 Claims



1. A balanced steerable power transmission comprising:
an input shaft;
an output shaft;
a steerable yoke pivotable about an axis coaxial with the output shaft;
a first drive train comprising a first ring gear coupled to the input shaft and to a first planetary gear, the first planetary gear being coupled to a first sun gear connected directly

to the output shaft for coupling the input shaft to the output shaft;

gear means carried by the steerable yoke;

means for coupling the output shaft to the gear means carried by the yoke;

a second drive train comprising a second ring gear coupled to the input shaft and to a second planetary gear, the second planetary gear being coupled to a second sun gear, the second sun gear being coupled to the gear means on the yoke for coupling the input shaft to the gear means in equal magnitude and opposite sense to the coupling of the first drive train to the output shaft so that there is no net rotational force on the steerable yoke in response to rotation of the input and output shafts; and

a pivotable spider interconnecting said first and second planetary gears for coordinating precession of said planetary gears.

4,619,159

WRENCHING UNIT FOR USE IN POWER THREADING OF A SLEEVE PORTION TO A PIPE PORTION USED IN MAKEUP OF OIL WELL CASINGS OR THE LIKE

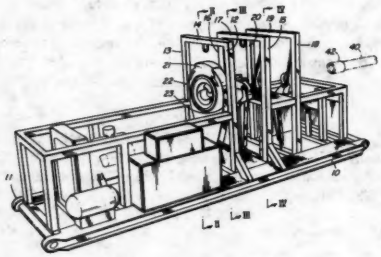
Stanley Kurek, Box 67, Fort Kent, Alberta, Canada

Filed Apr. 18, 1985, Ser. No. 724,666

Claims priority, application Canada, Feb. 4, 1985, 473492

Int. Cl.[4] B25B *13/50*

U.S. Cl. 81—57.34 **11 Claims**



1. A wretching unit for applying a threaded collar portion to a threaded end of a tubular portion for use in an oil well casing, said wrenching device comprising, in combination:

(a) a power tong section including a drive unit for rotating said power tong section about a generally horizontal axis of rotation in a predetermined direction and clamp means for fixedly but releasably clamping the power tong section to one of said tube portion and said sleeve portion to transmit the rotation of said power tong section to a first one of said portions in order to thread or release same onto or from the other one of said portions;

(b) backup tong means including a backup tong section generally coincident with said axis and comprising clamping means for fixedly but releasably clamping the backup tong section to the other one of said portions, and anchoring means adapted to prevent rotation of the backup tong section when the backup tong section is engaged with the other one of said portions about said axis;

(c) said power tong section and said backup tong section being secured to a supporting frame such that the power tong section and the backup tong section are displaceable relative to each other, referring to the said axis in (1) a normally generally horizontal and axial direction, (2) in a normally generally horizontal and radial direction, and (3) in a normally generally vertical and radial direction when the tong sections are engaged with the sleeve portion and with the tube portion, respectively.

4,619,160

POWER WRENCH

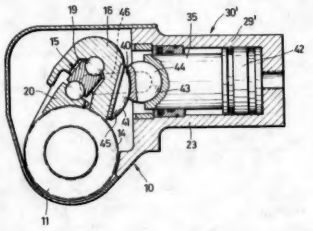
Alois Meyer, Neunkirchen-Seelscheid, Fed. Rep. of Germany, assignor to Paul-Heinz Wagner, Much-Birrenbachshöhe, Fed. Rep. of Germany

Filed Mar. 29, 1985, Ser. No. 717,548

Claims priority, application Fed. Rep. of Germany, Apr. 7, 1984, 3413202

Int. Cl.[4] B25B *13/46*

U.S. Cl. 81—57.39 **9 Claims**



1. In a power wrench of the type provided with an arm supporting a ring placeable over a wrench head, and a piston cylinder unit coupled at one end to the arm at a position on the arm distant from the ring, the piston-cylinder unit for turning a wrench head placed in said ring by moving the arm to rotate it about the axis of the ring, the improvement comprising:

a spherical bearing member located between said arm and said piston-cylinder unit, said spherical bearing member having generally oppositely disposed first and second spherical surfaces of different radii of curvature, the radius of curvature of said second spherical surface being greater than that of said first spherical surface;

a first complementary surface to said first spherical surface, said first complementary surface located at said first end of said piston-cylinder unit and slidably contacting said first spherical surface of said spherical bearing member; and

a second complementary surface to said second spherical surface, said second complementary surface located on said arm at said position on the arm distant from the ring and slidably contacting said second spherical surface of said spherical bearing member, contact between said spherical surfaces and their respective complementary surfaces being maintained when said piston-cylinder unit turns said wrench head.

4,619,161

SUPPORT FOR WHEEL LUG WRENCH

Keith H. Reynolds, 26 Samuel Rd., Chelmsford, Mass. 01824

Continuation of Ser. No. 688,323, Jan. 2, 1985, abandoned. This application Feb. 3, 1986, Ser. No. 825,770

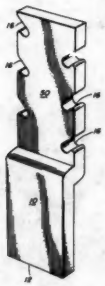
Int. Cl.[4] B25B *23/00*

U.S. Cl. 81—462 **19 Claims**

1. A support for a wheel lug wrench comprising a block having a top, a base for positioning on a firm surface and at least two parallel vertical sides intersecting the base and extending upwardly from the base;

a plurality of wrench supporting slots formed in both sides of the block and extending inwardly at an angle inclined toward the base, each slot terminating at a closed end which is positioned on a vertical line which is located inwardly of and between the vertical sides, the base having a width which extends between the vertical sides, the width of the base being at least as wide as the sides so that when the base of the support is on a firm surface the closed end of each slot is positioned vertically above the base to afford lateral stability;

the slots being located at spaced intervals from the base to provide a series of wrench supports of varying heights;
the closed end of each slot having an arcuate portion engagable with the wrench;
whereby, the wrench may be selectively positioned in a slot



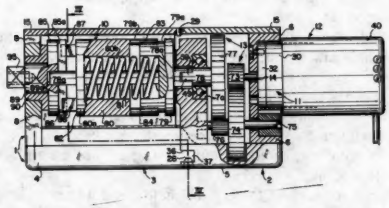
to align and support it while removing or attaching a given wheel lug nut;
the slots on one side of the block being located in staggered height-wise relationship to those on the other side;
whereby the distance between each slot and the base is different.

4,619,162

HAND-HOLDABLE ELECTRIC POWER TOOL APPARATUS

Christiaan G. M. Van Laere, Rainstr. 86, CH-8038 Zürich, Switzerland

Continuation-in-part of Ser. No. 430,763, Sep. 30, 1982, Pat. No. 4,505,170. This application Mar. 29, 1984, Ser. No. 594,797
The portion of the term of this patent subsequent to Mar. 19, 2002, has been disclaimed.
Int. Cl.⁴ B25B *19/00*
U.S. Cl. 81—464 **5 Claims**



1. An electric rotary power tool apparatus holdable by hand during operation and comprising an apparatus casing consisting essentially of an elongated building block assembly having a longitudinal axis and consisting essentially of

(1) a central building block comprising a base element, having a front end, a rear end,

(1.1) a first upright vertical wall at said rear end and extending at right angle to said longitudinally axis, and having an opening therein,

(1.2) a second upright vertical wall extending at right angle to said longitudinal axis and being spaced forwardly relative to said first vertical wall, said second vertical wall having a bore therein;

(2) a second rearward building block consisting essentially of an electric motor comprising

(a) a motor housing comprising a surrounding hull, a forward end wall and a rearward end wall and being mounted on the outside of said first upright vertical wall;

(b) a driving rotor shaft, with a central longitudinal axis therethrough, and extending through the interior of said motor housing and being rotatably supported in said rearward and foreward end walls thereof and extending with a forward shaft end through said opening in said first upright vertical wall,

(c) a rotor mounted inside said motor housing on said driving rotor shaft for rotating said shaft,

(d) commutator means comprising

(d.1) a commutator consisting essentially of collector segments and being mounted on said driving rotor shaft for rotation therewith between said rotor and said rearward motor housing end wall,

(d.2) first and second brush means mounted in said motor housing for electrical contact with said collector segments and delivering electric current to said rotor, and

(d.3) first and second stationary contactors being electrically conductively connected with said first and second brush means, respectively, said stationary contactors being firmly mounted in said motor housing rearward end wall and having terminal portions having contactable sidewall regions, said terminal portions protruding rearwardly from an outer face of said motor housing rearward end wall and ending in a transverse terminal region therein;

(3) a speed-reducing unit in said central building block;

said speed-reducing unit consisting of a gear train comprising a plurality of gears and a number of transmission shafts each bearing a gear, one of said gears being a pinion mounted on said forward shaft end of said driving rotor shaft, one of said transmission shafts being a driven power-transmitting shaft, said transmission shafts being supported in said first and second vertical walls, respectively.

(4) an on-off and reversing switch being adapted for switching a direct electric current having an electric potential from 8 to 30 volts and an amperage sufficient for affording a power input of said motor of 180 watt and, under load, of 620 watt;

said on-off reversing switch comprising supporting cover means, spaced from and pivotally mouned on said external face of said motor housing rear end wall and having a transverse wall having an inner face extending substantially transversely to said longitudinal rotor axis, and an outer face;

a pair of shiftable contactors each having a lateral contact region and being mounted in said cover means and extending substantially axially relative to said central longitudinal axis from outside said outer face thereof through said cover means transverse wall and protruding from the inner face thereof toward said motor housing rear end wall and into said transverse terminal region therein by a distance such as to extend parallel with said stationary contactor terminal portions by a sufficient length for said lateral contact regions of said shiftable contactors to make contact with said contactable sidewall regions of said terminal portions in axially extending contact zones thereof, when said cover means are angularly pivoted into either one of two limit positions relative to said motor housing end wall, while breaking contact when in at least one intermediate position between said limit positions;

said cover means having passage means for the introduction of a pair of lead means extending from a source of electric energy, into the interspace between said motor hoursing rear end wall and said inner face of said cover means transverse wall, and into electrically conductive engagement with said pair of shiftable contactors,

(5) a third forward building block comprising

(5.1) a rotary tool holder,

(5.2) a driven shaft therefor, and

(5.3) connecting means for connecting said driven shaft of said third unit by way of said bore in said second vertical wall with said driven power-transmitting shaft for rotation therewith;

(6) means for detachably fastening said rearward building block in said first vertical wall, and

(7) means for detachably connecting said third building block with said central building block, thereby enabling replacement of said second and third building blocks.

4,619,163

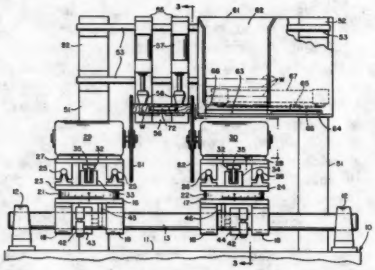
AUTOMATIC MITERING APPARATUS

Irving J. Brown, R.D. 2, Cato, N.Y. 13033

Filed Jul. 9, 1984, Ser. No. 629,179

Int. Cl.[4] B23D *45/10*

U.S. Cl. 83—82 **13 Claims**



1. Automatic mitering apparatus for wood blocks and the like, comprising

a frame, means defining a work station on said frame feeding means operable intermittently and automatically to feed workpieces in a first direction and one-by-one onto said station,

clamping means responsive to the movement of a workpiece onto said station automatically to clamp such workpiece intermediate its ends against movement on said station,

a pair of mitering saws mounted to rotate on said frame in a pair of spaced planes located adjacent opposite sides, respectively, of said work station,

means responsive to the clamping of a workpiece on said station for automatically reciprocating of said saws in said planes between retracted and advanced positions along paths disposed to intersect opposite ends, respectively, of said workpiece, thereby to cause the rotating saws during movement to their advanced positions to cut away opposed end portions of said workpiece,

means responsive to the movement of said saws to their retracted positions, and operative independently of said feeding means, for automatically and successively releasing and ejecting said workpieces from said station in a direction transversely of said first direction after it has been cut by said saws,

cycling means operative in response to the ejection of a workpiece from said station automatically to actuate said feeding means to feed the next successive workpiece to said station to be clamped thereon by said clamping means, and

means operative to effect translational shifting movement of said saws slightly towards said opposite sides of said work station before cutting the workpiece thereon, and to effect translational shifting movement of said saws slightly and transversely away from said work station immediately following the cutting said workpiece.

4,619,164

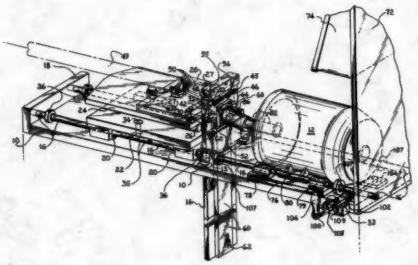
ORBITAL STRIPPING DEVICE

Paul W. Aikens, Etters, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Dec. 10, 1984, Ser. No. 679,874

Int. Cl.[4] B26D *3/08*

U.S. Cl. 83—200 **3 Claims**



1. Apparatus for selectively cutting the exterior layers of a plurality of cables each having a central conductor comprising:

a cutter plate with a preselected array of cutting orifices,

a positioning plate having an array of positioning orifices corresponding to the cutting orifices for positioning a plurality of cables parallel to an axis transverse to the cutter plate with the end of each cable in a different orifice, the plates being slidiably positioned relative to each other,

a movable fixture adapted to hold the cables, the fixture being movable along the axis to adjust the position of the cables relative to the plates

orbital means for effecting relative orbital motion, in a plane transverse to the axis, between the two plates about the axis, whereby the cutting orifices progressively cut through the exterior layers of the cables, the orbital means including

a rotary prime mover having an output shaft with an axis of rotation,

a rod-like member having an axis and mounted on the output shaft with the member's axis non-parallel to the shaft's axis of rotation so that the peripheral surface of the member defines the orbital motion,

a bearing housed by one of the plates and positioning means adapted to slidingly receive the rod-like member and transmit the orbital motions to one of the cutter plate and positioning means,

means to position the output shaft along its axis relative to the bearing thereby to adjust the axial position of the rod-like member in the bearing and hence the radius of the obital motion,

the adjusting means including a slide mount for the prime mover to permit movement of the prime mover along the axis of shaft rotation, and

means to position the prime mover along the axis of rotation to adjust the radius of orbital motion, the rod-like member being positioned so that the axis of rotation of the shaft and rod-like member intersect in the region of the rod-like member and the rod-like member is positioned in the bearing at the point of intersection of the axes, whereby axial movement of the prime mover in either direction increases the radius of orbital movement, and means to position the fixture along the axis to advance to or withdraw the cables from the plates, thereby to permit the simultaneous stripping of the exterior cut layers from the cables by withdrawing the cables from the plates.

4,619,165

APPARATUS FOR CUTTING OFF PIECES FROM WIRE COMB BINDING MATERIAL

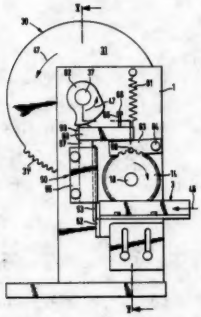
Peter Renz, Unterm Stein 9, D-7072 Heubach-Lautern, Fed. Rep. of Germany

Filed Jan. 3, 1985, Ser. No. 688,592

Claims priority, application Fed. Rep. of Germany, Jan. 25, 1984, 3402353

Int. Cl.[4] B26D *5/22*

U.S. Cl. 83—246 2 Claims



1. An apparatus with a cutting device for the cutting of pieces of a wire comb binding material for the binding of packs of sheets having marginal perforation, wherein the pieces cut off have a selectable number of teeth, comprising:

(a) a vertical frame;

(b) a guide for said material mounted on said frame;

(c) a first shaft mounted for rotation on said frame and above said guide;

(d) a conveying wheel mounted on one end of said shaft and fixed thereto and having conveying teeth conforming in pitch to said selectable number of teeth and in cooperative relationship with said guide;

(e) a toothed wheel mounted on the other end of said first shaft and fixed thereto;

(f) a brake mounted on said first shaft between said conveying wheel and said toothed wheel;

(g) a second shaft mounted for rotation on said frame and above said first shaft defining a power shaft with sufficient force to overcome said brake;

(h) a sector gear wheel mounted and fixed thereto on one end of said second shaft, said sector gear wheel comprising a given number of teeth only in a sector of adjustable central angle, while, in the remaining sector, it has a radial extent, which is too small for an engagement of said toothed wheel, said given number of teeth driving said toothed wheel only when engaged therewith;

(i) cut off means mounted for reciprocation in a vertical plane on said frame incooperation with an end of said guide;

(j) a cam mounted on the other end of said second shaft with the cam surface thereof positioned at a central angle different from said given number of teeth and engaging said cut off means when said sector gear wheel is disengaged from said toothed wheel; and

(k) a pivoted catch element engaging said conveying teeth and engaging said cam surface for preventing feed of said material during cut off.

4,619,166

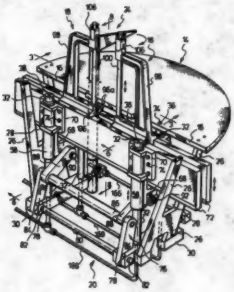
DOUBLE-BLADED POWER HACKSAW

Viljo K. Valavaara, Ontario, Canada, assignor to Colic Machine & Tool Limited, Woodstock, Canada

Filed Jan. 25, 1985, Ser. No. 694,774

Int. Cl.[4] B23D *49/02*

U.S. Cl. 83—461 15 Claims



1. A hacksaw apparatus, for use in association with a work piece and a source of pressurized hydraulic fluid, wherein the hacksaw apparatus comprises:

a frame, adaptable to receive and support the work piece;

two hydraulic cylinder means mounted on said frame, and connectable to said source of pressurized hydraulic fluid, each said cylinder means including a cylinder and piston rod, said piston rod extending through both ends of said cylinder and whereby said cylinder is slidably mounted on said piston rod;

two hacksaw support structures connected to respective said hydraulic cylinder means, whereby operation of a said hydraulic cylinder means moves a said hacksaw support structure relative to said frame;

a hacksaw mounted on each said hacksaw support structure, and, in opposition to one another and, and operable to cut against opposite sides of said work piece; and,

hacksaw movement means operable to move each said hacksaw against said work piece from opposite sides and to maintain pressure between each said hacksaw and said work piece during a hacksaw cutting stroke.

4,619,167

ADJUSTABLE CIRCULAR INSULATION SAW SYSTEM

Harry C. Davis, 8993 Airline Hwy., Baton Rouge, La. 70815

Division of Ser. No. 310,962, Oct. 13, 1981, Pat. No. 4,466,170, which is a continuation-in-part of Ser. No. 63,743, Aug. 6, 1979, Pat. No. 4,295,263. This application Feb. 22, 1984, Ser. No. 582,315

Int. Cl.[4] B23D *3/02, 57/00*

U.S. Cl. 83—607 6 Claims

1. A circular cutting blade apparatus comprising:

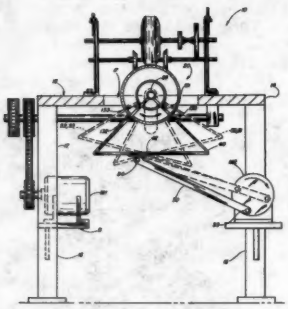
a. a cylindrical blade holder comprising an endless cylindrical band having a substantially uniform thickness;

b. an annular groove being provided on said cylindrical band and having a generally uniform cross section about the periphery of said band;

c. a first toothed cutting blade attached to said cylindrical band at said groove; and

d. a second toothed cutting blade having a thickness substantially equal to the thickness of said blade holder less the

thickness of said first blade, the first and second blades being affixed together with the toothed portions of the



blades being positioned adjacent one another during cutting.

4,619,168

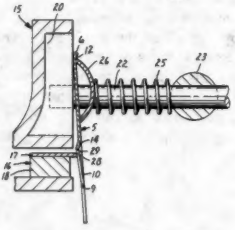
CUTTING MECHANISM

Leo M. Klisch, Falcon Heights, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation of Ser. No. 586,200, Mar. 5, 1984, abandoned. This application Aug. 30, 1985, Ser. No. 771,268

Int. Cl.[4] B26D *1/00*

U.S. Cl. 83—694 **9 Claims**



1. A paper shear comprising

an anvil to support a sheet of material to be cut transversely, said anvil having a corner defining an anvil edge for cooperation with a blade and along which the material will be cut,

a generally planar rectangular blade of thin sheet metal having a working face defined by a top edge, opposite side edges and a bottom edge which tapers toward said top edge from a point adjacent at least one side edge, said sheet metal being formed with a bend along a line parallel to said bottom edge, the amount of said bend being progressively greater from said one side edge toward said top edge, said bend being directed from the plane of the blade toward said anvil to increase the thickness of said blade by 100 to 175 percent and to define the cutting edge along the working face which will maintain contact with said anvil at least at one point upon vertical movement of said blade in the plane of said working face and,

means for biasing said blade toward said anvil.

4,619,169

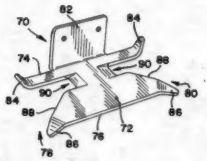
CUTTER MECHANISM FOR LAMINATE SLITTING MACHINE

Michael T. King, Palatine, Ill., assignor to D&K Custom Machine Design, Inc., Elk Grove Village, Ill.

Filed Oct. 2, 1985, Ser. No. 782,961

Int. Cl.[4] B26D *5/22*

U.S. Cl. 83—697 **4 Claims**



1. In a slitting machine having cutter means for slitting laminate material between adjacent articles in a continuous web of said articles with said articles having overlapping borders, said cutting means having oppositely-facing cutting blades and being formed with a downwardly-extending guide edge on one side of each of said cutting blades and an upwardly-extending guide edge on the other side of each of the cutting blades, the improvement of said cutter means having generally rectangular slots between said downwardly-extending and upwardly-extending guide edges with said slots having generally transverse bases that define said cutting blades to accommodate slight misalignment between said cutter means and said overlapping borders.

4,619,170

GUIDE FOR A HAND POWER TOOL

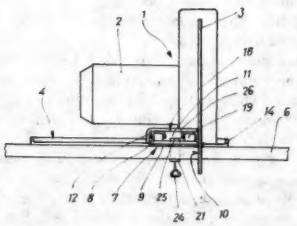
Peter Maier, Gerokstrasse 1, 7311 Neidlingen, and Gernot Hänsel, Gerstenstrasse 31, 7000 Stuttgart 70, both of Fed. Rep. of Germany

Filed Dec. 10, 1984, Ser. No. 679,757

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1983, 3344732

Int. Cl.[4] B27B *9/04*

U.S. Cl. 83—745 **14 Claims**



1. A guide device for a hand power tool which is movable in a feed direction to make a cut in a work, comprising a guide plate adapted to be placed on a work to be cut and a foot plate adapted to be placed on said guide plate, said foot plate being fixed to said tool and being movable along said guide plate in the feed direction for guiding said tool in the feed direction, said guide plate having the form of an elongated band with an edge lying substantially at the cut to be made by said tool while it is guided in the feed direction on said guide plate, said foot plate having a pair of bar members thereon and spaced from each other in the feed direction, each bar member having a recess therein to receive said guide plate, and each bar member straddling said guide plate with said guide plate substantially

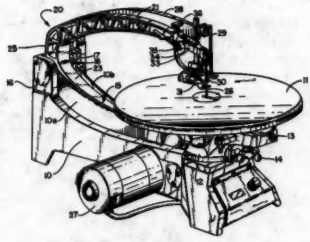
fully within said recess of each bar member in the space , said tool being fixed to said foot plate in position to prevent lateral movement of said foot plate on said guide plate.

4,619,171

BEARING ASSEMBLY FOR C-ARM SCROLL SAW

David Miller, Tupelo, Miss., assignor to Delta International Machinery Corp., Pittsburgh, Pa.

Filed Jul. 19, 1985, Ser. No. 757,123
Int. Cl.[4] B23D *49/00*
U.S. Cl. 83—782 **9 Claims**



1. A scroll saw, comprising:

(a) a base having a table mounted at one end and a horizontal pivot shaft, having a central portion and opposite ends, mounted at an opposite end of said base;

(b) a C-arm member having upper and lower arms and a curved bight connecting said arms, said arms terminating in upper and lower ends having a saw blade connected therebetween and extending through said table;

(c) means mounting said C-arm member on said pivot shaft at said curved bight including an opening in said bight, means for reciprocating said C-arm member and said pivot shaft to effect movement of said saw blade; and

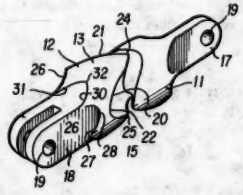
(d) said base comprising a pair of spaced side wall members having a pair of upstanding bearing support members at said opposite end of said base, with oppositely disposed bearing support openings therein, tapered roller bearings in said openings to support said opposite ends of said pivot shaft, means for adjustably locking said bight to said central portion of said pivot shaft extending therethrough, and means including resilient means on said bearing support members applying an inwardly directed force to said bearings to hold said bearings, pivot shaft and C-arm member in place.

4,619,172

CUTTING SAW FOR GRINDING SOLID MATERIALS

Rafael Perez, Box 474, Saint Just, P.R. 00902

Filed Jul. 5, 1985, Ser. No. 751,862
Int. Cl.[4] B27B *33/14*
U.S. Cl. 83—830 **3 Claims**



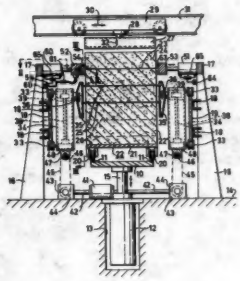
1. A cutting element adapted to cut in two laterally spaced planes when connected in series comprising a longitudinally extending element body formed to include an enlarged central portion having corresponding top and bottom faces and corresponding side faces and a longitudinal extension at each end of said element formed with a laterally extending pin-receiving hole therein, said faces including first oppositely disposed cutting edges which extend longitudinally from the center of the side faces of said enlarged central portion to substantially meet one another at the center of the top and bottom faces of said enlarged portion, and second oppositely disposed cutting edges which extend longitudinally from the center of said side faces to one of said longitudinal extensions adjacent said top and bottom faces, wherein each successive blade is connected to another by being rotated 90° relative to its preceeding blade.

4,619,173

METHOD AND APPARATUS FOR LIFTING PIECES OF MATERIAL

Rolf E. Göransson, Åkarp, and Oystein Kalvenes, Lund, both of Sweden, assignors to Internationella Siporex AB, Malmo, Sweden

Filed Jan. 9, 1985, Ser. No. 690,056
Claims priority, application Sweden, Jan. 12, 1984, 8400144
Int. Cl.[4] B26D *3/28, 7/06*
U.S. Cl. 8.3—870 **13 Claims**



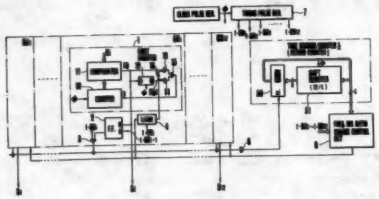
13. An apparatus for lifting slab-like pieces of material separated by substantially horizontal cuts, from a block of lightweight or aerated concrete material which is only partially cured and which is relatively soft and plastic but nevertheless shape-retaining, said apparatus comprising a suction device which is adapted to act on an upper surface of an upper piece of material and is movable to lift said upper piece and carry it away, at least one movable cover means arranged to cooperate with at least one substantially vertical side of said block and having at least one cavity therein with an open side facing said block side, means for moving said cover means to and from a position in which it is sealingly connected to and the open cavity side thereof is covered by a portion of said block side, said portion extending along and reaching above and below a region of a cut separating said upper piece of material from an underlying slab-like piece of material or residual part of said block of material, means for supplying pressurized, substantially gaseous medium to said cavity prior to lifting said upper piece of material by said suction device, and raisable and lowerable cutting wire holders which are horizontally movable relative to the block of material and which have at least two cutting wires located at mutually different levels and which, for the purpose of setting the vertical distance between the cutting wires, can be rotated and adjusted to desired rotational positions about a horizontal rotational axis extending substantially at right angles to the horizontal direction of movement of said cutting wire holders.

4,619,174

ELECTRONIC MUSICAL INSTRUMENT

Takatoshi Okumura, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 619,068, Jun. 11, 1984, abandoned, which is a continuation of Ser. No. 367,905, Apr. 13, 1982, abandoned. This application Oct. 7, 1985, Ser. No. 785,103
Claims priority, application Japan, Apr. 15, 1981, 56-57701; May 14, 1981, 56-73251; May 22, 1981, 56-77670
Int. Cl.[4] G10H *1/18, 7/00*
U.S. Cl. 84—1.01 20 Claims



13. An electronic musical instrument comprising:

clock pulse generating means for generating clock pulses;

a plurality of tone production channels, each of which includes frequency dividing means with an output pulse made by dividing the frequency of said clock pulses at a frequency division ratio of either one of N and N+1, where N is a positive integer;

time division counting means for counting, on a the time division basis, said output pulses outputted from said frequency dividing means; and

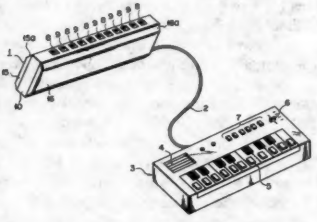
control means for determining, on the time a division basis, the frequency division ratios of said frequency dividing means in accordance with the counted values of said time division counting means, whereby each of said tone production channels individually produces a tone signal having a frequency determined by a combination pattern of N and N+1.

4,619,175

INPUT DEVICE FOR AN ELECTRONIC MUSICAL INSTRUMENT

Akio Matsuzaki, Tokorozawa, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Dec. 12, 1983, Ser. No. 560,155
Claims priority, application Japan, Dec. 21, 1982, 57-192111[U]; Dec. 30, 1982, 57-196779[U]; Dec. 30, 1982, 57-196782[U]; Feb. 10, 1983, 58-17415[U]
Int. Cl.[4] G10H *1/00*
U.S. Cl. 84—1.01 15 Claims



1. An input device for an electronic musical instrument, comprising:

a main body having a plurality of ducts,

a plurality of actuators arranged to be driven by air sucked into and blown out of said plurality of ducts, and caused to flow through said ducts; and

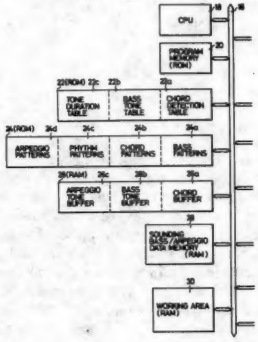
a plurality of musical tone input switch means associated with said ducts, each of said switch means including a conductive movable member arranged to move according to the actuation of each of said plurality of actuators by the air flowing through said ducts, an a stationary contact member arranged to produce a contact signal upon contact with said conductive movable member.

4,619,176

AUTOMATIC ACCOMPANIMENT APPARATUS FOR ELECTRONIC MUSICAL INSTRUMENT

Sigeki Isii, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 551,269, Nov. 14, 1983, abandoned. This application Jun. 6, 1985, Ser. No. 741,714
Claims priority, application Japan, Nov. 20, 1982, 57-204000
Int. Cl.[4] G10F *1/00*
U.S. Cl. 84—1.03 11 Claims



1. An automatic accompaniment apparatus for an electronic musical instrument, comprising:

a keyboard including keys;

time divisional data processing means which forms at a first time division depressed key data representing respective keys depressed on said keyboard, forms at a second time division a plurality of key data corresponding to the actual accompaniment tones to be possibly sounded based on said depressed key data generates at a third time division a sounding timing signal for instructing timings for sounding of accompaniment tones, and reads out at a fourth time division key data for said accompaniment tones to be sounded from hereinbelow said memory means by selectively designing addresses in said memory regions in response to said sounding timing signal;

memory means for storing said plurality of key data in separate memory regions, respectively; and

means for generating accompaniment tone signals based on the respective key data thus read out.

4,619,177

MUSICAL INSTRUMENT PNEUMATIC ACTUATOR

Kenneth B. Caulkins, 1320 Angie #C, Modesto, Calif. 95351

Filed Apr. 30, 1985, Ser. No. 728,937
Int. Cl.[4] G10F *1/02*
U.S. Cl. 84—50 21 Claims

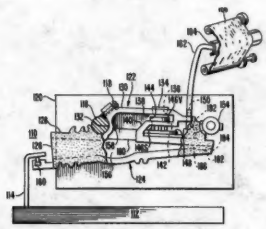
1. An invention comprising a musical instrument pneumatic actuator having:

(a) a plastic upper body piece including a front portion, an offset portion, a valve cover portion with an atmospheric port surrounded by an upper valve seat, said valve cover

portion connected to and offset from said front portion by said offset portion, a vacuum chamber enclosing portion connected to said valve cover portion and having a vacuum port surrounded by a lower valve seat, a vacuum hole, and a signal hole;

(b) a valve member with a valve portion and a stem portion, said valve portion disposed between said upper valve seat and said lower valve seat for alternate seating thereon, said stem portion extending through said vacuum port;

(c) a pouch in said vacuum chamber enclosing portion and operable for moving said valve member;



(d) a lower body piece; and

(e) a bellows piece attaching said upper body piece to said lower piece for relative pivotable movement therebetween; and

wherein said upper body piece is integral such that said upper valve seat and said lower valve seat are integral with each other, and wherein said valve portion has a larger upper surface area than said atmospheric port, said atmospheric port having boundaries which are integral with said upper body piece.

4,619,178

STOP ANGLE CONTROLLER FOR A VIBRATO MECHANISM ON A VIBRAPHONE

Motoya Kondoh, Shizuoka, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Japan

Filed Aug. 9, 1985, Ser. No. 764,429

Claims priority, application Japan, Aug. 10, 1984, 59-121872[U]; Aug. 10, 1984, 59-121873[U]; Jun. 21, 1985, 60-134307

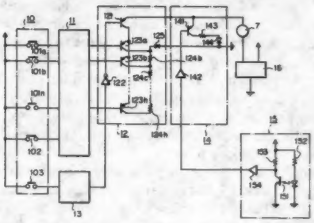
Int. Cl.⁴ G10D *13/08*

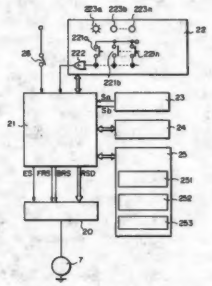
U.S. Cl. 84—410 **10 Claims**

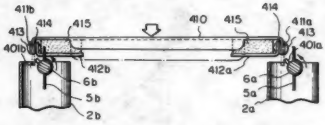
1. Stop angle controller for a vibrato mechanism on a vibraphone comprising:

a drive motor for driving a plurality of fans arranged on a shaft of said vibrato mechanism for common rotation,

means for detecting the angular position of said fans and for generating of a detection signal as a function thereof;







means for controlling, in response to said detection signal, the operation of said drive motor to stop rotation of said fans at a selected stop angle.

4,619,179

(MUSICAL) DRUMS

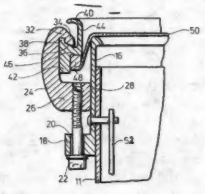
Robert J. Wright, Reservoir, Australia, assignor to Legato Pty. Ltd., Reservoir, Australia

Filed Nov. 26, 1984, Ser. No. 675,085

Claims priority, application Australia, Dec. 1, 1983, PG2659

Int. Cl.⁴ G10D *13/02*

U.S. Cl. 84—413 **2 Claims**



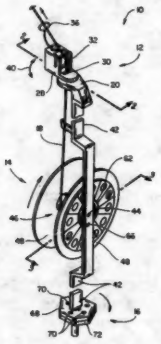
1. A drum head including a cylindrical side wall the end rim of which a skin is stretched thereover, said skin having a peripheral beading or flesh hoop spaced radially outwardly from said side wall, a cylindrical hoop co-axially mounted with

respect to said cylindrical side wall and surrounding a part of said cylindrical side wall, said cylindrical hoop having a first inner downwardly disposed shoulder spaced radially outwardly from said side wall and which engages said periheral beading or flesh hoop and a second outer upwardly disposed shoulder slanting upwardly and outwardly above said first shoulder, an upward extension outwardly of said second shoulder, said cylindrical hoop having an outer cylindrical surface of substantial axial dimension extending downwardly from said upward extension, a plurality of adjustable stretching means for exerting tensioning forces on said skin, each of said stretching means including a clip and a tensioning bolt, each of said tensioning bolts projecting through an aperture in an outwardly protruding skirt portion of said cylindrical side wall and substantially aligned with said flesh hoop, each of said clips being C-shaped with an upper arm part having a downwardly and inwardly disposed hook for engagement over said upward extension and on said second shoulder of said cylindrical hoop and to be lockingly engaged with said cylindrical hoop and a lower arm part abutting said cylindrical side wall, a vertically straight inner surface between said arms engaging said outer cylindrical surface, said tensioning forces acting in an imaginary cylindrical surface co-axial with and adjacent said cylindrical side wall and substantially intersecting said peripheral beading or flesh hoop and said tensioning bolts, each said tensioning bolt threadably engaging with its respective clip.

4,619,180
BRAIDER CARRIER

James D. Moyer, Downington, Pa., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jul. 26, 1985, Ser. No. 759,533
Int. Cl.[4] D04C *3/16, 3/02*
U.S. Cl. 87—57 **18 Claims**



1. A braider carrier guide pulley assembly for wide ribbon strand, said assembly comprising:

a support having a first opening therethrough to receive strand to be braided, said first opening having an axis therethrough normal to said first opening and generally coincident with the longitudinal axis of strand to be braided and being defined as the strand axis;

a pulley frame operatively, pivotly mounted to said support about said strand axis and having a second opening therethrough concentric with said strand axis;

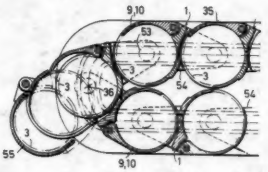
a cylindrical guide pulley operatively rotatably mounted to said pulley frame and having a axis of rotation normal to the strand axis, the pulley having a generally cylindrical surface that is tangent to said strand axis; and,

a delivery eye operatively connected to said pulley frame and in alignment with said pulley to guide a strand to be braided to a braiding point, said eye and said first and second openings capable of holding strand to be braided against said cylindrical surface of said pulley preventing strand to be braided from twisting while said pulley frame pivots during a braiding operation.

4,619,181
AMMUNITION AND MAGAZINE FOR AN AUTOMATIC LOADING ARRANGEMENT

Manfred Pehker, Duesseldorf; Erich Zielinski, Haan; Josef Metz, Neuss, and Adolf P. Bierwirth, Kaarst, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 13, 1985, Ser. No. 711,394
Claims priority, application Fed. Rep. of Germany, Mar. 13, 1984, 3409018
Int. Cl.[4] F41D *10/14*
U.S. Cl. 89—34 **9 Claims**



1. An ammunition holding mechanism for an automatic loading arrangement for gun barrel weapons, which holding mechanism when arranged in a juxtaposed plural arrangement forms a link of an interlinked endless ammunition magazine, comprising in combination,

(a) said holding mechanism including an arcuately shaped tray for receiving the cartridged ammunition having a projectile head and a casing with a casing bottom, which tray has a semi-circular shape and at least two support regions, the inner diameter (d_1) of the first support region for supporting the forward region of the projectile of the cartridged ammunition is smaller than the inner diameter (d_2) of the second support region for supporting the rear region of the casing;

(b) pivotally mounted holding means for partially encompassingly holding the cartridged ammunition in each support region, each of said holding means being mounted on the same longitudinal side of the tray;

(c) each of said holding means including a pair of arcuately shaped clamp members pivotally connected to each other, an opening and closing mechanism operatively connected to said pair of clamp members for independently operating each holding means with respect to the other holding means, and prestressing means operatively connected to each holding means for independently biasing each holding means into a closed position in which it holds radially playfree the cartridged ammunition in the two support regions.

4,619,182
ARRANGEMENT FOR DEFLECTING POWDER GASES FROM AN AIRCRAFT WEAPON

Gunnar Hellstrom, Linköping, Sweden, assignor to Saab-Scania Aktiebolag, Linköping, Sweden

Filed Jan. 26, 1984, Ser. No. 574,057
Claims priority, application Sweden, Jan. 31, 1983, 8300464
Int. Cl.[4] F41D *11/24*
U.S. Cl. 89—37.16 **6 Claims**

1. Gas deflector means whereby powder gases issuing forwardly from the barrel of an aircraft-carried gun are deflected to one side of the forwardly extended axis of said barrel and to a discharging direction away from parts of the aircraft that would be adversely affected by such gases, said gas deflector means comprising:

A. a housing;

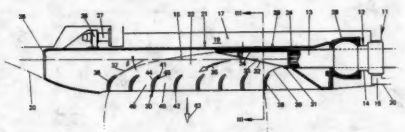
B. a mouthpiece forwardly adjacent to the gun barrel for initially deflecting powder gases towards said one side of said extended axis, in the form of a length of straight pipe concentric to said axis and having an inside diameter at least as large as that of the gun barrel, said mouthpiece having an outlet that opens obliquely forwardly and toward said one side of said axis, defined by an edge thereon which

(1) is contained in a plane disposed at an acute angle to said extended axis and

(2) extends along the mouthpiece from a point that is near the rear end thereof but spaced forwardly therefrom and at said one side of said axis to a point that is at the diametrically opposite side of said axis and at a substantially pointed front end of the mouthpiece; and

C. a plurality of guide plates mounted on the housing at the exterior of said mouthpiece, for further deflecting said gases to said discharging direction,

(1) each said guide plate having substantially opposite inner and outer edges that extend substantially transversely to said extended axis, said inner edge of each guide plate being proximal to said extended axis,



(2) said guide plates

(a) having their inner edges spaced to said side of said extended axis at substantially uniform distances therefrom and

(b) being spaced apart in the direction along said axis at substantially uniform distances to cooperate in defining gas outlet slots, and

(3) each guide plate being so curved between its inner and outer edges as to have

(a) its surface portions adjacent to its outer edge extending substantially in said discharging direction and parallel to the corresponding surface portions of the other guide plates, and

(b) its surface portions adjacent to its inner edge extending substantially in the direction of gas flow that has issued from the mouthpiece and is meeting its inner edge, the last mentioned surface portions of the plurality of guide plates being at angles to said extended axis which decrease progressively from the guide plate closest to the mouthpiece to the guide plate farthest from the mouthpiece.

4,619,183

DEVICE FOR CAUSING A FIREARM TO FIRE IN CONTROLLED BURSTS

Paolo Benelli, Pesaro, Italy, assignor to Benelli Armi S.p.A., Urbino, Italy

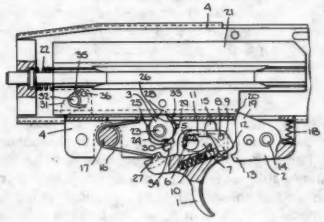
Filed Apr. 19, 1984, Ser. No. 602,216

Claims priority, application Italy, May 9, 1983, 44020 A/83

Int. Cl.[4] F41D *11/10*

U.S. Cl. 89—129.02 **2 Claims**

1. In a firearm including a receiver, a bolt, means resiliently biasing the bolt towards a firing position, a bolt stopping element which releasably engages the bolt in a rest position thereof and prevents the bolt from moving to its firing position, means resiliently biasing the bolt stopping element into releasable engagement with the bolt, a trigger pivotally connected to the receiver for moving the bolt stopping element out of engagement with the bolt to release the bolt, and means resiliently biasing the trigger toward a rest, non-firing position, the improvement comprising apparatus causing the firearm to fire in controlled bursts, said apparatus comprising a ratchet wheel pivotally connected to the receiver, means resiliently urging the ratchet wheel towards a rest position when the trigger is in its rest position, the ratchet wheel comprising a plurality of trip teeth corresponding to the number of shots to be fired by a single burst and a plurality of lugs equal in number to the number of trip teeth, the trigger having a trip tooth for releasably engaging the trip teeth of the ratchet wheel in a pivoted, firing position of the trigger to stop pivoting of the ratchet wheel, an arm pivotally connected to the bolt, means resiliently biasing the arm into engagement with a lug on the ratchet wheel as the bolt moves towards its rest position from its firing position to cause release of the ratchet wheel by a trip tooth of the trigger and rotation of the ratchet wheel until the



next ratchet wheel trip tooth is engaged by the trigger trip tooth, the trigger being pivoted on a pin, a rocking arm pivotally connected to the trigger, means resiliently biasing the rocking arm into engagement with the pin on which the trigger is pivoted, the rocking arm having a trip tooth, the bolt stopping element having a trip tooth releasably engageable by the trip tooth of the rocking arm when the rocking arm engages the pin to hold the bolt stopping element out of engagement with the bolt, one of the trip teeth on the ratchet wheel being releasably engaged by the trip tooth of the trigger and permitting the trigger to pivot to a position causing the rocking arm to release the bolt stopping element and permit it to move into engagement with the bolt, said one trip tooth of the ratchet wheel defining the end of the burst.

4,619,184

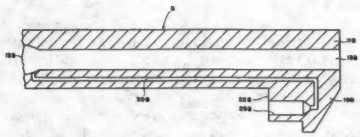
GAS ACTUATED PISTOL

Ilan Shalev, Givataim, Israel, assignor to The State of Israel Ministry of Defense, Military Industries, Ramat-Hasharon, Israel

Continuation of Ser. No. 555,334, Nov. 28, 1983, abandoned. This application Dec. 19, 1985, Ser. No. 810,549

Int. Cl.[4] F41C *5/02*

U.S. Cl. 89—185 **5 Claims**



1. In a fully gas operated pistol including:

a frame unit defining first and second sections extending to the front and rear ends thereof, respectively;

a barrel unit defining an axial bore with muzzle and breech ends and front and rear locking means fixedly receivable by said frame unit at the front and rear ends thereof;

a bolt carrier unit intermediary between said frame and barrel unit, slidably supported on said frame unit and slidable between said front and rear locking means of the

barrel unit and including a forward, barrel receiving section and a rear, bolt receiving section, said forward section including a bridge-like member connecting two opposite walls of the bolt carrier unit;

biasing means having a first end in contact with said frame unit and a second end in contact with said bridge-like member for urging the bolt crarier unit forward,

the improvement wherein:

(i) said bolt carrier unit comprises a piston extending forwrad from said bridge-like member;

(ii) said barrel unit comprises, near the muzzle end, a rearward facing cavity to accommodate said piston of the bolt carrier unit, said cavity being hereinafter referred to as the piston accommodating cavity;

(iii) said barrel unit further comprises a passage linking the breech end of said axial bore with said piston accommodation cavity, said passage being distinct and separate from said axial bore which passes comprises an intake port near the breech end of the barrel, a main section extending in parallel to the barrel and essentially coextensive therewith and a delivery section designed for injecting propellant gas into said cavity to expand rearward therein;

(iv) the arrangement being such that gases expanding from the breech end of the barrel unit is consequence of a bullet being fired expand under pressure to said piston accommodating cavity whereby the bolt carrier unit is forced against the action of said biasing means from a first, forward position in which said piston extends into the piston accommodating cavity, to a second, retracted position; and after the emergence of the bullet from the muzzle and the consequential full expansion of the gases, the bolt carrier unit is urged by said biasing means back into said first position.

4,619,185

BRAKE BOOSTER

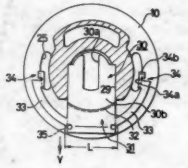
Kohei Mori, Ogawa, and Haruo Suzuki, Higashimatsuyama, both of Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 684,450

Claims priority, application Japan, Dec. 28, 1983, 58-199987[U]

Int. Cl.⁴ F15B *9/10*

U.S. Cl. 91—369 R **3 Claims**



1. In a brake booster including a power piston disposed within a closed vessel and subject to a pressure differential for reciprocatory movement, a valve mechanism for controlling fluid pressure supplied to said power piston, a valve body in which said valve mechanism is housed, a valve plunger disposed within said valve body and defining part of said valve mechanism, a bore formed to extend through said valve body, and a stop member inserted into said bore for engagement with said valve plunger to prevent said valve plunger from being withdrawn from said valve body, comprising the improvement wherein a retainer is provided which includes a support which supports said stop member and also including a detent which is engageable with a mating detent defined by an axially extending opening formed on said valve body, said axially extending opening providing communication between pressure chambers in said brake booster, said retainer being positioned externally of said stop member, the engagement between said detent on said valve body and said detent on said retainer being effective to prevent said stop member from being disengaged.

4,619,186

PRESSURE RELIEF VALVES

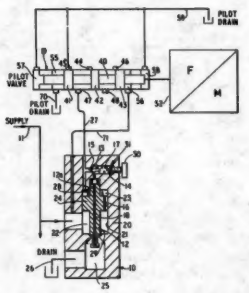
Ronald B. Walters, Wembley, United Kingdom, assignor to Vickers, Incorporated, Troy, Mich.

Continuation of Ser. No. 348,779, Feb. 16, 1982, abandoned, which is a continuation of Ser. No. 959,865, Nov. 13, 1978, abandoned. This application Feb. 14, 1985, Ser. No. 701,793

Claims priority, application United Kingdom, Sep. 3, 1977, 36869/77

Int. Cl.⁴ F15B *11/10*

U.S. Cl. 91—433 **10 Claims**



1. A hydraulic relief valve system for controlling the supply pressure of a hydraulic supply line extending unrestrictedly from a hydraulic supply to a hydraulic load comprising

a main relief valve,

a pilot valve having a control port and a drain port for controlling the supply pressure in said supply line,

said main relief valve comprising a housing having a valve seat, a closure member cooperating with the said seat and a piston attached to said closure member, said piston in said housing defining an inlet chamber connected to said supply line and a control chamber,

said housing and closure member forming an outlet chamber,

a hydraulic return line extending from said outlet chamber to a drain,

a hydraulic passage extending between said control chamber and inlet chamber and defining a control path,

said control path having a restriction therein,

a control line extending between said control chamber and said control port of said pilot valve for applying a control pressure to said control chamber which pressure is the pressure prevailing between the restriction and said pilot valve, and

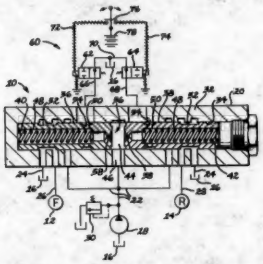
an electric force motor for operating said pilot valve,

said pilot valve having at least one feedback chamber to which pressure is applied from said supply pressure or a pressure associated with the hydraulic device to which supply pressure is applied, said pressure to said feedback chamber being opposed to the force produced by said electric force motor and acting in a direction to connect said control port to said drain port.

4,619,187
FLUID CONTROL FOR TWO INDEPENDENT ACTUATORS

William W. Blake, Kewanee, and Alan R. Coutant, Chillicothe, both of Ill., assignors to Caterpillar Inc., Peoria, Ill.

PCT No. PCT/US82/01540, § 371 Date Oct. 25, 1982, § 102(e) Date Oct. 25, 1982
PCT Filed Oct. 25, 1982, Ser. No. 638,447
Int. Cl.[4] F15B *11/00*
U.S. Cl. 91—523 6 Claims



1. A fluid control system (10) for selectively controlling actuation of a pair of actuators (12,14) comprising:

a reservoir (16);

a pump (18) connected to the reservoir (16);

a control valve (20) having a bore (34), a pair of directional spools (36,38) slidably positioned in the bore (34), a common actuating chamber (44) defined in the bore (34) between one end of each of the directional spools (36,38), and first and second actuating chambers (40,42) each being defined in the bore (34) at the other end of each of the directional spools (36,38), said common actuating chamber (44) being in fluid communication with said pump (18), each of the directional spools (36,38) being movable between a first position at which the pump (18) is in communication with one of the actuators (12,14) and a second position at which said one of the actuators is in communication with the reservoir (16), said directional spools (36,38) being arranged in the bore (34) so that only one of the directional spools (36,38) is moved to its first position when one of the first and second actuating chambers (40,42) is pressurized;

orifice means (56) for communicating said pump (18) with said first and second actuating chambers (40,42); and

control means (60) for selectively pressurizing said first and second actuating chambers (40,42).

4,619,188
PNEUMATIC CYLINDER DEVICE WITH LOCKING MECHANISM

Takashi Kimura, Nagoya, Japan, assignor to Nippon Joucomatic Co., Ltd., Tokyo, Japan

Filed Dec. 19, 1984, Ser. No. 683,614
Claims priority, application Japan, Dec. 21, 1983, 58-241654
Int. Cl.[4] F15B *15/26*
U.S. Cl. 92—26 13 Claims

1. A pneumatic cylinder device with a locking mechanism comprising a pneumatic cylinder having a cylinder, a piston slidably received in said cylinder and a piston rod extending from said piston outwardly of said cylinder; and a locking mechanism adapted to selectively lock said piston rod against movement;

said locking mechanism comprising:

a housing disposed adjacent said cylinder and through which said piston rod is slidably extended;

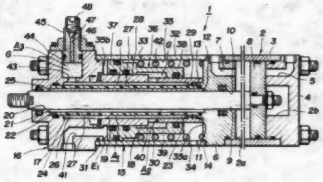
a flexible tubular member disposed in said housing so as to surround said piston rod, said flexible tubular member being contractable and expandable in a radial direction for locking and unlocking of said piston rod;

an annular variable-volume chamber means formed around said flexible tubular member and having a variable volume;

a volume changing means for causing a change in the volume of said variable-volume chamber means; and

a pressure transmission means accommodated in said variable-volume chamber means and adapted to transmit to said flexible tubular member a pressure change produced in said variable-volume chamber means as a result of a volume change; and

said variable-volume chamber means including a first pressure chamber formed between the outer peripheral surface of said flexible tubular member and the inner periph-

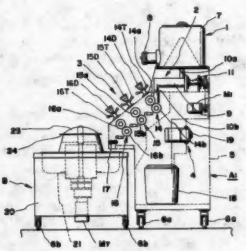


eral surface of an annular partition wall means extending in said housing in the axial direction, said partition wall means having a large-diameter portion and a small-diameter portion; and a second pressure chamber defined by a stepped outer peripheral surface of said annular partition wall means and a recess formed in the inner peripheral surface of a control piston slidably fitted over said stepped outer peripheral surface, said second pressure chamber communicating with said first pressure chamber through communication passage means formed in said annular partition wall means, said second pressure chamber extending over at least said small-diameter portion of said annular partition wall means, the volume of said second pressure chamber being variable as a result of axial sliding movement of said control piston with respect to said annular partition wall means.

4,619,189
APPARATUS FOR MANUFACTURING BOILED NOODLES

Nagai Kou, Takasaki, Japan, assignor to Hoshino Butsusan Co., Ltd., Gunma, Japan

Filed Feb. 4, 1985, Ser. No. 697,840
Claims priority, application Japan, Feb. 17, 1984, 59-26987
Int. Cl.[4] A47J *27/10*
U.S. Cl. 99—334 16 Claims



1. A boiled noodles manufacturing apparatus comprising in combination:

at least one raw noodle manufacturing unit including a grain

flour supplying means for supplying and measuring grain flour, a kneading means connected to said grain flour supplying means for kneading said grain flour, said kneading means including a worm-shaped screw wing and a blade, a kneading water supplying means for measuring and supplying kneading water to said kneading means for kneading said grain flour into a kneaded noodle substrate and a noodle element forming means connected to said kneading means for forming raw noodle elements from said kneaded noodle substrate; and

a boiling unit for boiling said raw noodle elements fed from said noodle element forming means including a rotating wheel which is rotatable intermittently and which supports at least one removable basket which receives said raw noodle elements, a sensor means for producing an electric signal when sensing said basket passing through a predetermined position, a controlling unit means generating electric signals corresponding to a predetermined number of meals for controlling said at least one raw noodle manufacturing unit and said boiling unit, whereby the predetermined number of meals is fabricated from said grain flour by controlling starting and stopping operations of said at least one raw noodle manufacturing unit and said boiling unit by said electric signals from said controlling unit means.

4,619,190

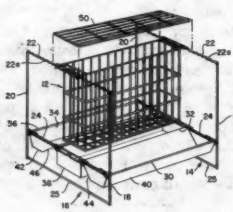
VERTICAL BED PORTABLE COOKING GRILL

Douglas A. Smith, R.F.D. #1, Box 54, Ellsworth, Me. 04605

Filed Nov. 12, 1985, Ser. No. 797,115

Int. Cl.[4] A47J *37/00*

U.S. Cl. 99—393 **20 Claims**



1. An improved cooking grill comprising:

a vertically oriented fuel bed elongate in the vertical direction providing a vertical radiant source of heat for cooking food in cooking zones on either side of the bed;

a portable and collapsible grill frame of rectangular configuration formed by light weight rods assembled in three tiers, a top tier, a lower tier and base level;

said vertical radiant source being supported in the center of the frame removeably suspended from the top tier and not extending below the lower tier;

an ash tray removeably suspended from the lower tier below the vertically oriented fuel bed but above the base level so that the ash tray and vertically oriented fuel bed are supported by the frame a safe distance above a surface on which the grill may be placed;

first and second drip trays removeably suspended from the lower tier below the cooking zones on either side of the vertically oriented fuel bed and adjacent to the ash tray, said ash tray and drip trays comprising a substantially continuous surface between the lower tier and base tier across the grill frame for reflecting heat upward to protect a surface on which the grill may be placed, said ash tray and drip trays being removeable from the grill frame for cleaning and for portability;

said grill frame comprising end rods rigidly assembled in rectangular end frame pieces having said three tiers, and elongate cross rods removeably extending between the end frame pieces at the upper and lower tiers for suspending the vertically oriented fuel bed, ash tray and drip trays from the end frame pieces;

a plurality of panels for providing reflector oven enclosure of the grill frame including end panels extending from the top tier to the lower tier over the end frame pieces of the grill frame and at least one side panel and cover panel extending between the end frame pieces over the top and side of one cooking zone of the grill frame;

said side panel and cover panel being removeable and replaceable on the grill frame and constructed and arranged for use alone or in combination on the grill frame to provide lesser or greater enclosure of the cooking zone for varying oven enclosure effects;

4,619,191

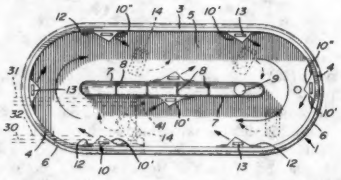
APPARATUS FOR THAWING, HANDLING AND REHEATING SEALED FROZEN FOOD PACKETS

Gérard Dumas, 2601 Clément Street, Charlesbourg, Canada G2N 1A1, and Jean A. Marcoux, 260 Jardin des Cascades, Beauport, Canada G1E 6J5

Filed Oct. 22, 1984, Ser. No. 663,090

Int. Cl.[4] A23L *1/00*

U.S. Cl. 99—483 **5 Claims**



1. An apparatus for changing the temperatures of a plurality of sealed food pouches, comprising: a large bath formed of a bottom surface and of an exterior wall including elongated parallel sides and opposite ends of which at least their inner surfaces are rounded; a central, elongated wall spaced inwardly of the exterior wall including its ends; such construction defining an interior closed course; said bath being adapted to contain a liquid with said food pouches immersed therein; a plurality of identical flow-inducing means, disposed at both said exterior wall and said central wall at spaced locations along said walls and directed angularly and in the same direction relative to said course, each said flow-inducing means including a nozzle, said nozzle located in a casing formed of a first face disposed at an obtuse angle relative to said course and having at least one slot formed therein and in registry with said nozzle; said nozzle communicating with a compressed gas supply; a second face disposed at a right angle to said first face, thereby defining a casing of triangular cross-section; whereby whirlpool effects are created as said liquid circulates around the course to heat or cool each said sealed food pouch thoroughly and rapidly.

4,619,192

POTATO CUTTER

Michael A. Cycyk, 265 N. Payne Ave., N. Tonawanda, N.Y. 14120, and Robert R. Seitz, 115 Albert Ave., Buffalo, N.Y. 14207

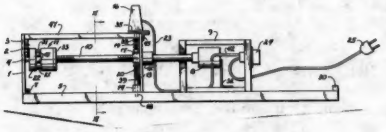
Filed Dec. 7, 1984, Ser. No. 679,392

Int. Cl.[4] A23L *1/212;* A23P *1/00*

U.S. Cl. 99—538 **17 Claims**

1. A potato cutting device capable of cutting an entire potato into a shoe-string form which comprises in combination a source of energy, a drive rod attached at one end to said source of energy, a receiving chamber, a cutting means, a prong potato-holding means and a stripper plate assembly attached to

the opposite end of said drive rod, said stripper plate assembly comprising at least two drive fingers adapted to penetrate and support a potato and a main body having movably connected thereto at least two stripper bolt means, said stripper bolt means having attached at its outer end a stripper plate, said bolt means adapted to selectively move said stripper plate toward



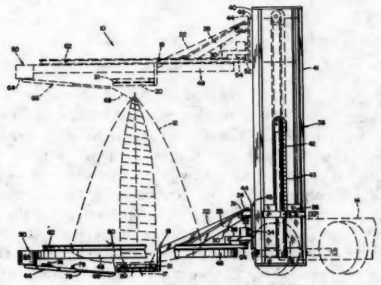
said cutting means thereby adapted to push a potato off said drive fingers and cause the entire potato to be consumed in said cutting operation, located and provided in substantially the center of said stripper plate are stripper fingers positioned around a receiving chamber, said chamber adapted to mate with said potato prong-holding means which is located adjacent said cutting means.

4,619,193

STANDING TREE BALER

Gerald W. Crew, 22399 S. Spring Creek Rd., Estacada, Oreg. 97023

Filed Mar. 29, 1985, Ser. No. 717,642
Int. Cl.[4] B65B *13/20*
U.S. Cl. 100—13 **13 Claims**



1. An apparatus for baling a tree in situ, the tree including a trunk and branches, comprising:

collar means for encircling a tree trunk, the collar means being adapted to press the branches inward toward the trunk;

guide means attached to the collar means for centering the collar means over the trunk and for guiding the collar means from its centered position along the trunk; and

securing means associated with one of the collar means and the guide means for spirally baling the pressed branches to the trunk as the collar means is guided along the trunk.

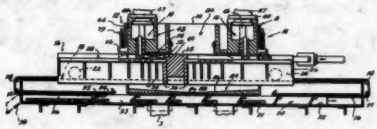
4,619,194

APPARATUS FOR DEWATERING FIBROUS MATERIALS

William G. Pierce, 4613 Socialville-Foster Rd., Mason, Ohio 45040

Filed Apr. 3, 1984, Ser. No. 591,514
Int. Cl.[4] B30B *9/06*
U.S. Cl. 100—127 **8 Claims**

7. In a dewatering press wherein the material to be dewatered is confined between two surfaces, one constituting a screen, the two surfaces being spaced apart a distance about $\frac{1}{8}$ to $\frac{3}{4}$ of an inch, and the material to be dewatered is pressed by a ram operated by hydraulic means in a direction parallel to the screen at a press rate which decreases as pressure continues, the pressure being asserted on the material being about



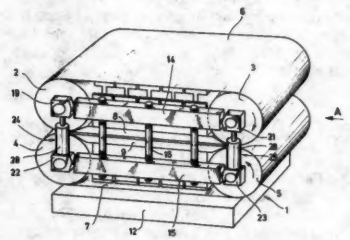
300–3,000 psi, the improvement comprising as part of the hydraulic means a load sensing variable volume hydraulic pump and a proportional flow control valve which permits the press to be operated under both low pressure/high flow and high pressure/low flow conditions.

4,619,195

DUAL-BELT PRESS FOR A CONTINUOUSLY ADVANCING WEB OF MATERIAL

Herr K. Held, Alte Strasse 1, 7218 Trossingen 2, Fed. Rep. of Germany

Filed Jan. 15, 1985, Ser. No. 691,688
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1984, 3402751
Int. Cl.[4] B30B *5/06*
U.S. Cl. 100—154 **5 Claims**



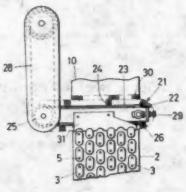
1. A dual-belt press for processing a continually advancing web of material, and having entry and delivery ends; said press comprising a rigid frame having upper and lower bearing bridges; two upper deflection drums and two lower deflection drums in underlying relation with said upper deflection drums whereby a gap is present between each upper and each underlying lower deflection drum; drum bearing blocks in which said deflection drums are rotatably mounted; said bearing blocks being articulately connected to such bearing bridges whereby said bearing blocks are movable toward and away from each other; upper and lower endless press belts movable over the upper and lower reflection drums respectively; pressure plates mounted on said frame and engageable with inner surface portions of said press belts moving between said deflection drums for exerting pressure on a web of material passing between said upper and lower deflection drums; and adjusting means connected to the bearing blocks for the deflection drums at least at the entry end of said press for controlling the interval therebetween whereby the pressure exerted in the gap defined by the press entry end drums is independent of the pressure exerted by the pressure plates.

4,619,196

TABLET PRINTING DEVICE WITH ORIENTING BRUSH

Hikoji Matsuoka, Osaka, Japan, assignor to Matsuoka Machinery Works Co., Ltd., Osaka, Japan

Filed Oct. 1, 1984, Ser. No. 656,735
Claims priority, application Japan, Oct. 3, 1983, 58-185472
Int. Cl.[4] B41F *17/36*
U.S. Cl. 101—35 **1 Claim**



1. In a tablet printing device comprising a rotary cylinder having peripheral recesses, a hopper for supplying tablets into said recesses, and printing roller means opposed to said rotary cylinder for printing tablets within said recesses, the improvement of means ensuring that all said tablets printed by said printing roller means are oriented in respective said recesses in a normal posture to be printed properly, said ensuring means comprising:

a pair of spaced pulleys;

an endless belt extending around and between said pulleys, said belt extending across the entire width of the periphery of said rotary cylinder;

bristles extending from said endless belt for contact with said tablets in said recesses; and

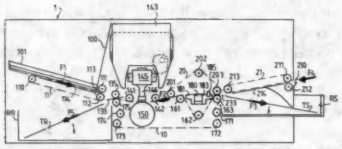
means for moving said belt across said periphery of said rotary cylinder in a direction extending at a right angle to the direction of rotation of said rotary cylinder and parallel to the axis of rotation of said rotary cylinder, and thereby for causing said bristles to impart lateral forces to said tablets and thus to reorient any said tablet from an incorrect posture within said respective recess to said normal posture therein.

4,619,197

APPARATUS FOR PRINTING AND INSPECTING CARD TICKETS

Alain L. N. Pailler, Bourg la Reine, France, assignor to Electronique Serge Dassault, Paris, France

Filed Nov. 16, 1984, Ser. No. 672,184
Claims priority, application France, Jun. 29, 1984, 83 10378
Int. Cl.[4] B41J *3/00*
U.S. Cl. 101—93.04 **8 Claims**



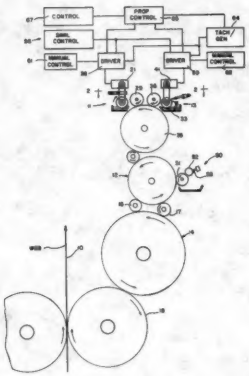
1. Apparatus for processing card tickets, the apparatus being of the type including means for reversibly driving a ticket along an internal path of the apparatus which path passes through at least one processing station, with at least one of the ends of the internal path being defined by a pair of wheels which are substantially tangential to each other, the apparatus further including a first guide and feed unit, outside the internal path, for bringing a ticket to said internal path, the improvement wherein the common tangent of the said pair of wheels is inclined relative to the guide axis of the said guide and feed unit and passes underneath the said unit, with the said axis being substantially tangential to the upper wheel of the said pair, thereby enabling a ticket to be reversed without the ticket returning to the said guide and feed unit, and without any need for switching means to deflect a reversing ticket away from the guide and feed unit, the apparatus further including a second guide and feed unit located at the other end of the internal path and cooperating therewith in the same manner as the first guide the feed unit.

4,619,198

METHOD AND APPARATUS FOR KEYLESS OFFSET PRINTING

Joseph P. Moll, 1310 Elm Dr., Schaumburg, Ill. 60194

Filed Dec. 24, 1984, Ser. No. 686,040
Int. Cl.[4] B41F *7/26, 7/28, 7/36;* B41L *25/02*
U.S. Cl. 101—148 **13 Claims**



1. A method of offset printing paginated sheets having differential columnar ink demand without individual columnar ink controlling systems, employing an ink fountain and a water fountain for supplying ink and water to a variable ink-water drum having a plurality of discrete hydrophilic and oleophilic areas, each capable of holding varying quantities of water and ink for transferring variable quantities of ink and water from the ink and water fountains to a plate cylinder and a scraper system for removing ink from the variable ink-water drum, wherein the plate cylinder carries a columnar plate with varying columnar ink demand, and a form roller for transferring ink and water from the ink-water drum to the plate cylinder including the steps of: adjusting the ink and water fountains to supply ink to the variable ink-water drum in sufficient and uniform amounts entirely across the drum to meet the demand for the plate cylinder column and corresponding sheet column requiring the highest quantity of ink of all columns and to exceed the demand of the other plate cylinder columns and corresponding sheet columns, and without metering ink and water directly on the ink-water drum, transferring ink and water from the variable ink-water drum with the form roller to the plate cylinder.

4,619,199

SAFING AND ARMING MECHANISM

Leo V. Giladett, Santa Cruz, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jul. 31, 1984, Ser. No. 636,454
Int. Cl.[4] F42C *15/36*
U.S. Cl. 102—254 **7 Claims**

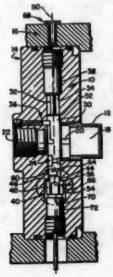
1. An out-of-line safing and arming mechanism for use with an explosive train in which a movable link couples on portion

of the train to another when the explosive train is armed comprising:

a slider means for moving the movable link along a predetermined direction between an explosive train safing position in which the train is interrupted and an explosive train arming position;

stop means for preventing said slider means from moving into said explosive train arming position;

a hollow connecting means structurally interconnecting said stop means and said slider means; and



detaching means disposed within said hollow connecting means for generating forces against said connecting means, said forces including a component transverse of said predetermined direction for breaking said connecting means in shear to break the interconnection of said stop means and said slider means, and said forces including a component along said predetermined direction and directed against said slider means for moving said slider means toward said explosive train arming position.

4,619,200

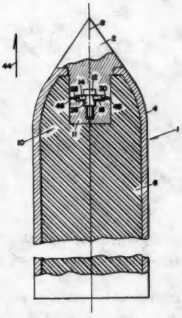
IMPACT IGNITION DEVICE FOR A PLURALITY OF STAB TYPE PRIMERS

Frank H. Bell, Logan, Utah, assignor to Morton Thiokol, Inc., Chicago, Ill.

Filed Mar. 27, 1985, Ser. No. 716,728

Int. Cl.[4] F42C *1/02*

U.S. Cl. 102—275 **7 Claims**



1. A multi-path impact type igniter for a projectile having a center-line that is parallel to the direction in which the projectile is launched comprising,

a plurality of stab type primers,

a plurality of rupture-discs, each of said rupture-discs being arranged to bear directly upon an individually associated one of said stab type primers,

an inertia mass having the shape of a conic body of rotation, said mass having a center-line that is coincident with the projectile center-line, and

a plurality of firing pins each of which have a first end and a second end, said firing pins being equally spaced apart and so supported for movement in a plane that is at an angle 90° with respect to the projectile center-line that each of said firing pins faces away from the projectile center-line with the first end thereof bearing directly on an individually associated one of said rupture discs, each of said firing pins having at the second end thereof a sloped conic surface forming a cam that is arranged in direct contact with said conic body-of-rotation inertia mass,

whereby upon impact of the projectile with a target after being propelled through space the inertia mass moves forward, due to the impetus thereof, at a high rate relative to the projectile and forces said firing pins away from the prcjectile center-line to pierce the associated rupture-disc and to enter and thereby actuate the associated stab type primer.

4,619,201

GRADUATED-DENSITY PACKED PROPELLANT CHARGE

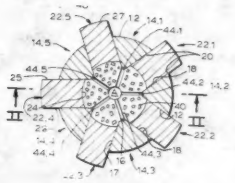
Rudolf Romer, Kaarst; Michael Schwenzer, Duesseldorf, and Reinhard Synofzik, Juelich, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Sep. 7, 1984, Ser. No. 648,798

Claims priority, application Fed. Rep. of Germany, Sep. 7, 1983, 3332224

Int. Cl.[4] C06D *5/06*

U.S. Cl. 102—283 **2 Claims**



1. In a propellant charge generally centered on an axis, said charge being formed of a mass of fluid propellant consisting of individual grains, the improvement wherein,

the propellant charge is arranged such that there is a uniform increase in density from the axis radially outwardly, whereby the average density of the charge exceeds the bulk density of the propellant.

4,619,202

MULTIPLE PURPOSE AMMUNITION

Rudolf Romer, Kaarst; Michael Schwenzer, Duesseldorf, and Reinhard Synofzik, Juechen, all of Fed. Rep. of Germany, assignors to Rheinmetall GmbH, Duesseldorf, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 561,545, Dec. 14, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,206

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1982, 3246173

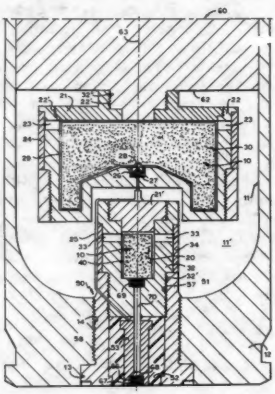
Int. Cl.[4] F42B *5/16*

U.S. Cl. 102—443 **14 Claims**

1. An improved multi-range ammunition unit for firing at a high angle and preselected exit muzzle velocity in which a plurality of partial propellant charges and the projectile are mounted in a shell casing and said partial propellant charges

are jointly or separately ignited for obtaining different ranges, and wherein at least one first propellant charge is fixedly mounted on the bottom of the shell casing, the improvement comprising

(a) at least one second propellant charge is fixedly connected to the bottom of said projectile and is disposed at least



partially in front of said first propellant charge in said shell casing; and

(b) means operatively connected to said first and second propellant charges for selectively first, and singly igniting said first propellant charge or jointly ignite said first propellant charge with at least one of said second propellant charges.

4,619,203

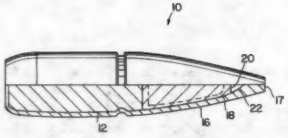
ARMOR PIERCING SMALL CALIBER PROJECTILE

Randall G. Habbe, Pocahantas, Ill., assignor to Olin Corporation, Stamford, Conn.

Filed Apr. 26, 1985, Ser. No. 727,716

Int. Cl.[4] F42B *11/08*

U.S. Cl. 102—516 **1 Claim**



1. An improved small caliber steel tipped lead projectile intended to penetrate armor, which projectile consists of:

(a) a lead core body portion,

(b) a steel nose portion, in front of the body portion, and case hardened to at least Rc50 from its surface to a depth of 0.030 inches and having an interior of a hardness below Rc50, and

(c) a bullet jacket about said body and nose portions.

4,619,204

DRIVERLESS TUGGER VEHICLE AND SYSTEM

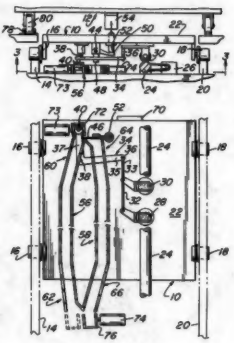
Per E. Lindquist, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Dec. 7, 1983, Ser. No. 559,124

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—166 **10 Claims**

1. A driverless tugger vehicle adapted to shuttle back and forth on a first path to push or pull another driverless vehicle each time it moves in a forward direction, said tugger vehicle including a platform having support wheels, at least one drive wheel on said tugger vehicle, said drive wheel being adapted to be in frictional contact with a drive shaft separate from the tugger vehicle and positioned to be adjacent to said first path for propelling the tugger vehicle, an actuator connected to said drive wheel in a manner so that the drive wheels can pivot



through an arc sufficient to cause the vehicle to be driven in opposite directions by a drive shaft, and means coupled to said actuator on said tugger vehicle adapted for selective engagement with another vehicle when the tugger vehicle moves in the forward direction to push or pull a second vehicle along a second path parallel to said first path only when the tugger vehicle moves in the forward direction.

4,619,205

CONVEYOR ARRANGEMENT

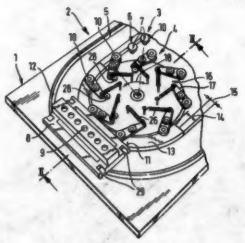
Walter Sticht, Attnang-Puchheim, Austria, assignor to STIWA-Fertigungstechnik Sticht GesmbH, Attnang-Puchheim, Austria

Filed Mar. 20, 1984, Ser. No. 591,560

Claims priority, application Austria, Mar. 29, 1983, 1117/83; Feb. 6, 1984, 360/84

Int. Cl.[4] B61B *13/12*

U.S. Cl. 104—168 **11 Claims**



1. A conveyor arrangement for conveying a workpiece carrier in a conveying direction, the carrier having two opposite sides, and a guide means for vertically and laterally guiding the carrier in said direction, the guide means comprising

(a) a means associated with one of the carrier sides for advancing the carrier in the conveying direction, the advancing means including

(1) a succession of entrainment elements engaging the one carrier side, and

(2) a turning transport device, the entrainment elements being circumferentially arranged on the transport de-

vice for engagement of successive ones of the entrainment elements with successive points on the one carrier side upon turning the device,

(b) a guide track of two guide ledges supporting the carrier for vertical guidance therealong and having respective sides spaced apart in a direction transverse to the conveying direction and extending in the conveying direction, one of the guide track sides being opposite the advancing means in the transverse direction for laterally guiding the carrier, the one guide track side being associated with the opposite carrier side, and the advancing means being arranged to bias the carrier towards the one guide track side, and

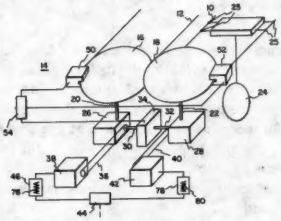
(c) guide elements mounted on the carrier and guided without play along the one guide track side.

4,619,206

DRIVE SYSTEM FOR A TWIN SUSPENSION HAULAGE CABLE GONDOLA LIFT

Denis Creissels, 43, Bld. des Alpes, 38240 Meylan, France

Filed Sep. 26, 1984, Ser. No. 654,657
Claims priority, application France, Oct. 3, 1983, 83 15838
Int. Cl.[4] B61B *11/00*
U.S. Cl. 104—178 **3 Claims**



1. An overhead cable transport installation drive system comprising:

terminals each having two end pulleys,

two endless parallel suspension haulage cables passing over said end pulleys and extending along two parallel loops,

two identical electric drive motors, each motor driving one of said pulleys,

gondolas coupled in line to said two cable loops,

an electrical power supply source for delivering current to said motors, and having a common armature supply for said two motors,

control means for controlling said power supply to each said motor for maintaining substantially equal the power outputs of said two motors,

said motors being direct current electric motors with separate excitation circuits, each motor having a field magnet and an armature winding, said armature winding being connected to said common armature supply of said power supply source by an armature circuit including a series connected resistor in series with the associated armature winding, said armature circuits being identically coupled in parallel across said common armature supply, said series connected resistors each being of a value for providing an IR voltage drop that increases with increasing armature current and thus directly provoking an armature voltage reduction equal to the resistor voltage drop increase and a resulting speed reduction when the power output of the associated motor increases for restoring identical power outputs of the two motors.

4,619,207

PALLET MADE FROM SHEET OF RIGID MATERIAL

N. Blake Boyce, Rigby, and J. Neil McSpadden, Shelley, both of Id., assignors to Universal Plastics, Inc., Salt Lake City, Utah

Filed Mar. 26, 1984, Ser. No. 593,686
Int. Cl.[4] B65D *19/38*
U.S. Cl. 108—51.1 **7 Claims**

1. In a pallet of the type comprising a sheet of generally rigid material having a top surface for supporting a load and a bottom surface which serves as a lift-engaging surface, and wherein the pallet further comprises

a peripherally extending rib projecting from the bottom surface,

a plurality of substantially radially extending ribs projecting from the bottom surface and oriented so as to extend from the central portion of the pallet outwardly toward the periphery of the pallet,

a plurality of hollow legs projecting from the bottom surface so as to form open depressions in the top surface, with the hollow legs further being positioned around the periphery of the sheet of rigid material, and

a central hollow leg projecting from the bottom surface so as to form an open central depression in the top surface, with the central hollow leg being positioned at the central portion of the sheet of rigid material, the improvement comprising

a recessed receptacle or cavity formed in the upper surface of the sheet of material so as to encircle the open central depression which forms the central hollow leg, said receptacle or cavity having a depth which is less than the distance which the central leg projects from the bottom surface of the sheet of plastic material, with the inner side of the receptacle or cavity opening to the hollow depression forming the hollow central leg whereby the receptacle or cavity forms a countersunk enlargement about the hollow central leg, and

a center plug or insert which has a central opening therethrough, with the central opening being of substantially the same size and shape as the open central depression of the central hollow leg, said center plug or insert further being adapted to fit snugly within the countersunk receptacle or cavity whereby the center plug provides strength for the pallet to resist deflection of the central portion of the pallet when the pallet is supported along the peripheral sides thereof with no support in the central portion of the pallet.

4,619,208

WORK SURFACE HEIGHT ADJUSTMENT MECHANISM

Andrew J. Kurrasch, Saugatuck, Mich., assignor to Herman Miller, Inc., Zeeland, Mich.

Filed Dec. 27, 1984, Ser. No. 686,846
Int. Cl.[4] A47B *9/00*
U.S. Cl. 108—144 **26 Claims**

1. A height adjustment mechanism for automatically adjusting the height of a work surface and comprising a left-side cable lift mechanism, a right-side cable lift mechanism, a central drive mechanism and cable means operatively coupling said left-side and right-side lift mechanisms to said central drive mechanism, and wherein each of said left-side and right-side lift mechanisms comprises:

mounting means for mounting said corresponding cable lift mechanism to a wall panel or a similar supporting surface;

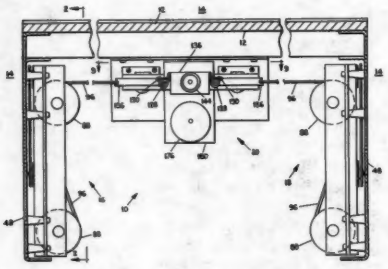
lift support means mounting said work surface and mounted

for guided vertical movement relative to said mounting means;

support pulley means secured to said lift support means and engaging said cable means for supporting said work surface; and

said central drive mechanism comprises:

central support means for mounting said central drive mechanism to said work surface;



force generating means; and

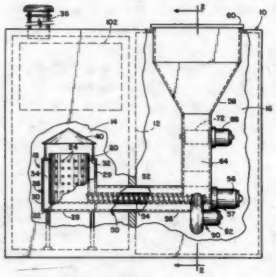
means connected to said cable means and to said force generating means for exerting forces on each of said lift support means in response to forces generated by said force generating means so as to selectively raise or lower said work surface.

4,619,209

FURNACE CONSTRUCTION

Joseph P. Traeger, 250 Oak St.; Randolph J. Traeger, 530 Alder St., and Mark A. Traeger, 540 Leo St., all of Mt. Angel, Oreg. 97362

Filed Aug. 8, 1985, Ser. No. 763,520
Int. Cl.[4] F23K *3/14, 3/16*
U.S. Cl. 110—110 **8 Claims**



1. In a furnace,

a pot with an open top for holding fuel during the burning process,

an elongate tube connecting at the outfeed end thereof with the interior of the pot and extending laterally therefrom, and an elongate rotatable auger extending within the tube for moving fuel along the length of the tube and thence into the pot,

perforate means formed in the side of the pot, and

air-flow-producing means including power-driven blower means, structure connecting with said blower means producing air flow by the blower means form outside the perforate means and through the perforate means to the pot interior for supporting combustion, and structure connecting with said blower means producing air flow by the blower means through said tube and out the outfeed end thereof to further support combustion and to inhibit reverse air flow through the tube.

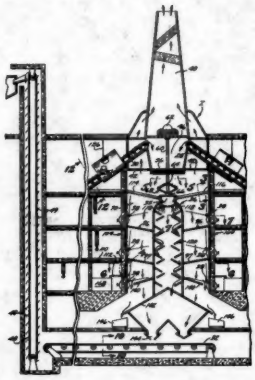
thereof to further support combustion and to inhibit reverse air flow through the tube.

4,619,210

SOLID AND LIQUID WASTE INCINERATOR SYSTEM

Leo D. Kennedy, 1540 Dalmatia Dr., San Pedro, Calif. 90732

Filed Feb. 5, 1985, Ser. No. 698,368
Int. Cl.[4] F23B *7/00*
U.S. Cl. 110—234 **18 Claims**



1. A solid and liquid waste incinerator comprising:

a furnace unit for generating heat having side walls and an evaporation cylinder located within the side walls;

a plurality of nozzles rotatably mounted along the side walls of said furnace unit and positioned at the upper portion of said evaporation cylinder and including ignition means for commencing combustion;

a plurality of loading means for moving said waste into said furnace unit;

a steam turbine generator utilizing said heat generated by said furnace unit for generating electrical energy and;

a plurality of conduit means for containing and transporting water and steam to said steam turbine generator, said conduit means located within said furnace unit whereby heat energy produced by said furnace unit causes said water to change state to steam thereby energizing said steam turbine generator to produce electrical energy.

4,619,211

APPARATUS FOR PRODUCING SHIRRING

Joseph R. Semon; William J. Semon; Lawrence J. Bonczar, all of Eynon; Helen Ceresko, Mt. Cobb, and William T. MacKirdy, Eynon, all of Pa., assignors to Casket Shells, Inc., Eynon, Pa.

Filed Aug. 25, 1983, Ser. No. 526,408
Int. Cl.[4] D05B *35/08*
U.S. Cl. 112—132 **9 Claims**

1. An apparatus for producing shirring which comprises:

a guiding means adapted to guide a panel of backing material to an adhering means so as to underlay fabric with backing material at the adhering means;

the adhering means located to receive fabric as it is conveyed from the guiding means;

a gathering means comprising a plurality of flexible mechanical projectons which automatically push fabric into folds, the guiding means being a guiding plate disposed below the gathering means and the gathering means comprising a movable support having the flexible mechanical projections extending therefrom wherein the flexible mechanical projections each having a substantially equal determined length and wherein the movable support being spaced a

predetermined distance from the guide plate, the predetermined distance being slightly less than the predetermined length of the flexible mechanical projections so that during operation of the invention of the flexible mechanical projections contact fabric passing over the guide plate, and the flexible mechanical projections being bent by

pressure from the guide plate and resultant pressure from the flexible mechanical projections on the fabric acts to press and push the fabric into folds;

a conveying means adapted to convey the panel of fabric and the panel of backing material whereby fabric and backing material pass the guiding means, gathering means, and the adhering means.

4,619,212

TUFTING MACHINE AND METHOD OF TUFTING FOR PRODUCING MULTIPLE ROWS OF TUFTS WITH SINGLE LENGTHS OF YARN

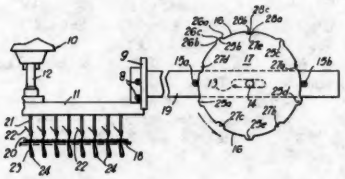
Roy T. Card, 4012 Creekwood Ter., Chattanooga, Tenn. 37421, and Joseph L. Card, 1515 Edgewood Cir., Chattanooga, Tenn. 37405

Continuation of Ser. No. 592,384, Mar. 22, 1984, which is a continuation of Ser. No. 496,010, May 19, 1983, Pat. No. 4,440,102. This application Apr. 15, 1985, Ser. No. 723,266

The portion of the term of this patent subsequent to Apr. 3, 2001, has been disclaimed.

Int. Cl.[4] D05C *15/30, 17/02*

U.S. Cl. 112—266.2 **7 Claims**



1. A method of tufting pile fabric comprising, feeding a backing material in one direction, reciprocably penetrating a plurality of needles carrying yarns through said backing material from one side thereof, said needles being spaced apart transversely to said feed direction, shifting said needles from a first position transversely to said direction while said needles are on one side of said material and spaced therefrom, penetrating said material with said needles, and shifting said needles to said first position while said needles are within the backing material and withdrawing said needles from said backing material to form loops of said yarns in said backing material.

4. In a tufting machine, means for feeding a base material in one direction, a plurality of yarn carrying needles spaced apart transversely to said one direction, means for reciprocating said needles to penetrate the base material and to form loops therein, means for mounting said needles for movement in a direction transverse to said one direction, pattern control means for shifting said needles from a first position while said needles are outside said base material and for shifting said needles back to said first position while said needles are within said base material.

4,619,213

DRIVE CONTROL MECHANISM OF SEWING MACHINE

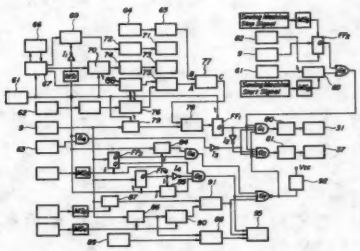
Ikurou Iimura, Kanagawa; Kuniharu Sakuma, and Haruo Iwabuchi, both of Tokyo, all of Japan, assignors to Tokyo Juki Industrial Co., Ltd, Chofu, Japan

Filed Sep. 27, 1984, Ser. No. 655,363

Claims priority, application Japan, Sep. 30, 1983, 58-183458; Sep. 30, 1983, 58-183459

Int. Cl.[4] D05B *69/36*

U.S. Cl. 112—273 **6 Claims**



1. In a sewing machine comprising a sewing machine motor operable in response to a start signal, a position detection means operatively connected with said sewing machine motor for producing a position signal each time said sewing machine motor operates to a predetermined extent, paying-out detection means disposed in a thread path between a thread take-up lever and a thread supply source for producing a thread feed signal varying depending upon the amount of thread fed from said supply source to said lever, and a motor stop circuit operable in response to the lack of a thread feed signal after the occurrence of a position signal to interrupt operation said sewing machine motor, characterized by a drive control mechanism comprising: control means for operating said motor to drive said sewing machine when a position signal is produced and without a thread feed signal being produced at the start of the operation of said sewing machine.

4,619,214

SEWING MACHINE WITH CAM-CONTROLLED NEEDLE BAR AND FEED DOG

Olindo Baruffa, Thonex, and Antonio Jimenez, Meyrin, both of Switzerland, assignors to Mefina, S.A., Switzerland

PCT No. PCT/CH84/00015, § 371 Date Oct. 10, 1984, § 102(e) Date Oct. 10, 1984, PCT Pub. No. WO84/03110, PCT Pub. Date Aug. 16, 1984

PCT Filed Feb. 3, 1984, Ser. No. 668,722

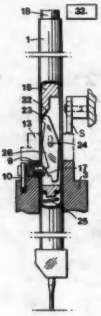
Claims priority, application Switzerland, Feb. 10, 1983, 737/83

Int. Cl.[4] D05B *3/02*

U.S. Cl. 112—459 **8 Claims**

1. In a sewing machine comprising elements for lateral control and positioning of a needle bar carried by an oscillating cradle and for the adjustment of the amplitude and the direction of displacement of a feed dog for the movement of the material to be sewn, the improvement comprising, an upper arm containing a first servomotor driving a cam having a plurality of cam faces, a first said cam face engageable with a first feeler attached to said needle bar cradle to direct lateral

positioning of the needle bar, a second said cam face cooperating with said first said cam face and engageable by another feeler, said another feeler connected to a support element and shiftable to a position for disengaging said needle bar, a lower



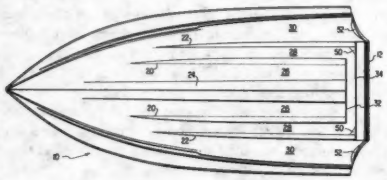
frame containing a second servomotor driving a second cam having a cam face, still another feeler engaging said face of said second cam, and pivoted means connecting said still another feeler to the feed dog to regulate the amplitude of the forward-/backward movement of the material to be sewn.

4,619,215

DUAL STEP, VEE TYPE PLANING HULL FOR POWER BOATS

Forrest L. Wood, Flippin; Dale H. Jensen, Everton; Kenneth P. Poley, Yellville; Charles C. Hoover, and Gary L. Wilson, both of Bull Shoals, all of Ark., assignors to Wood Manufacturing Company, Inc., Flippin, Ark.

Filed Apr. 3, 1985, Ser. No. 719,528
Int. Cl.[4] B63B *1/18*
U.S. Cl. 114—56 **7 Claims**



1. A deep vee entry hull having an angled transom and a central running surface extending fore and aft of the hull flanked, in the after portion thereof, by inboard, intermediate and outboard running surfaces; said intermediate running surfaces terminating at the after ends thereof in a first transverse step forward of said transoms and extending transversely between said intermediate running surfaces; and said central and inboard running surfaces terminating at the after ends thereof in a second transverse step, parallel with and forward of said first transverse step.

4,619,216

SAILBOAT LUFF SYSTEM

William Crear, III, 56 Westwood Dr., Long Lake, Minn. 55356, and Roy E. Ahern, 6449 Barrie Rd., Minneapolis, Minn. 55435

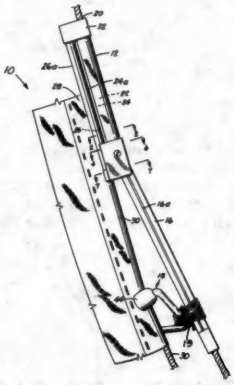
Filed Oct. 5, 1984, Ser. No. 657,931
Int. Cl.[4] B63H *9/04*
U.S. Cl. 114—105 **21 Claims**

1. An elongated support for simultaneously supporting a plurality of sailboat sails, on a sailboat stay wherein each sail has a forward edge luff comprising an elongated luff support member including:

first and second wall means formed to define a first elongated channel;

third wall means defining a second channel having a narrow slot opening, said third wall means being mounted to said first wall means and extending toward said second wall means;

fourth wall means defining a third channel positioned on an opposite side of said second channel from the first channel, said fourth wall means being mounted to said second



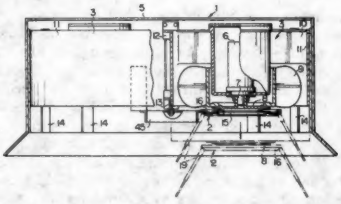
wall means and having a narrow slot opening facing in a different angular direction from the narrow slot opening of said second channel with respect to a bisecting plane of the first channel, and said second and third channels together defining a stay retaining slot opening leading to said first channel, which is resiliently closed by the first and second wall means urging the third wall means forming the second channel toward the second wall means, said stay retaining slot being openable by moving the third wall means away from the second wall means against the resilient urging.

4,619,217

APPARATUS FOR CLEANING UNDERWATER SURFACES

Kiyoshi Wachi, Machida, Japan, assignor to Macsea Marine Services Co., Inc., Tokyo, Japan

Filed Dec. 28, 1984, Ser. No. 687,424
Claims priority, application Japan, Apr. 4, 1984, 59-49566[U]
Int. Cl.[4] B63B *59/10*
U.S. Cl. 114—222 **12 Claims**



9. A cleaning apparatus for cleaning an underwater surface, comprising:

a housing;

a rotary brush having a brush base, mounted in said housing, having a front side for engaging the underwater surface, and a rear side opposite said front side;

a water pump mounted in said housing having means for a pumping stream of water from said front side to said rear side of said brush; and

means for rotating said brush, said brush being detachably mounted to said rotating means;

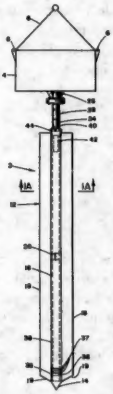
said brush including a front ring and a rear ring rearward of, concentric with, superposed over, and detachably fixed to said front ring, said front ring having a plurality of circumferentially spaced apart notches opening into the radial periphery thereof, said brush further comprising bundles of bristles extending generally forwardly through said notches and having head portions rearward of said notches between said front ring and said rear ring, said rear ring comprising means for sandwichingly fixing said head portions between said front ring and said rear ring such that said bundles are radially removable from said notches when said front ring is detached from said rear ring.

4,619,218

EMBEDMENT ANCHOR

Patrick M. Kenny, Belle Chasse, La., assignor to Hen-Jac, Inc., Belle Chasse, La.

Filed Jan. 30, 1984, Ser. No. 574,871
Int. Cl.[4] B63B *21/28*
U.S. Cl. 114—295 **6 Claims**



1. An embedment anchor for providing a mooring point embedded within a sea floor comprising:

a. a substantially heavy drive weight member:

b. a substantially elongated hollow drive tube assembly, extending vertically downward from said drive weight member;

c. a substantially elongated anchor spear coaxially, sealingly mounted about said drive tube member;

d. anchor rode attaching means connected to an upper point on said anchor spear;

e. low velocity explosive means within said drive tube assembly;

f. controllable detonation means adapted to detonating said explosive within said drive tube assembly; and

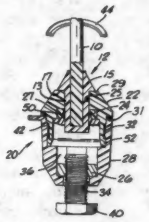
g. vertical position sensing means, adapted to detecting a tilt away from vertical of said anchor spear, adapted to preventing detonation of said explosive upon detection of said tilt away from vertical.

4,619,219

PRESSURE RELEASE SAFETY ANTENNA

Steven L. Millard, 1576 Wardman Dr., Brea, Calif. 92621

Filed Sep. 12, 1984, Ser. No. 649,802
Int. Cl.[4] G09F *17/00*; B60Q *9/00*
U.S. Cl. 116—28 R **10 Claims**



5. A reusable pressure releasable safety antenna for off-road vehicles comprising:

an elongated member, said elongated member having a visibility enhancement means connected thereto,

a pressure releasable mounting assembly, said mounting assembly having an upper section and a lower section,

a leash, and

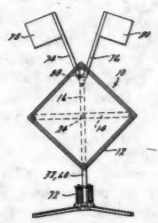
a means for connecting the lower section of the pressure releasable mounting assembly to the off-road vehicle, wherein said elongated member is connected to the upper section of the pressure releasable mounting assembly, said upper section having a channel circumscribing an exterior surface, said upper section being inserted within a recess in the interior of the lower section of the pressure releasable mounting assembly, the lower section having a ridge circumscribing the interior wall of the lower section, the ridge interlocking with the channel in the upper section when the upper section is properly inserted within the lower section, thereby preventing accidental loss of said safety antenna, and further wherein the leash is connected at one end to the lower section of the pressure releasable mounting assembly, the opposite end of the leash being connected to the elongated member, said upper section separating from said lower section before pressure exerted on said elongated member reaches the breaking point pressure of said elongated member.

4,619,220

COLLAPSIBLE SIGN WITH FLAGS

James R. Seely, Rochester, and Jerry A. McCabe, Union Lake, both of Mich., assignors to Marketing Displays, Inc., Farmington Hills, Mich.

Continuation of Ser. No. 573,193, Jan. 23, 1984, abandoned. This application Oct. 28, 1985, Ser. No. 792,634
Int. Cl.[4] G09F *7/18*
U.S. Cl. 116—63 P **21 Claims**



1. In a sign assembly of the type being collapsible from a

display configuration to a storage configuration, the sign assembly having at least one cross member supporting a sign, and further having at least one warning flag attached to a corresponding warning flag rod, the improvement comprising:

a first pivot means having a shaft and being affixed to said cross member for pivotably attaching the warning flag rod thereto;

a second pivot means affixed to the cross member; and

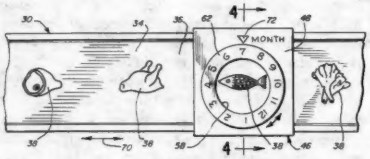
a warning flag support bracket pivotally attached to said cross member by said second pivot means, said warning flag support bracket having at least one curled end, said flag rod being journaled for rotation about said shaft of said first pivot means and said curled end being positionable to limit the pivotal movement of said flag rod in at least one rotational direction to hold said flag in the display configuration but otherwise free of rotational restraint, the warning flag rod and said bracket further being selectively pivotable into a substantially collinear relationship with respect to said cross member when the sign assembly is in the storage configuration, the warning flag rod extending in the display configuration in a generally opposite direction from that of the warning flag rod in the storage configuration.

4,619,221

INVENTORY INDICATING MEANS FOR REFRIGERATION APPARATUS

William J. Linstromberg, Lincoln Township, Berrien County, Mich., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Filed Sep. 21, 1984, Ser. No. 653,436
Int. Cl.[4] G09F *9/00*
U.S. Cl. 116—307 **11 Claims**



1. In a refrigeration apparatus having a cabinet defining a compartment for storing food items at refrigerated temperatures, and a food support member within said compartment defining a forward portion associated with an improved inventory indicating structure comprising:

an elongated guide track attached to said forward portion;

a plurality of first indicia distributed along said track, each indicium of said first indicia representing a food type;

indicating means adjustably, slidably mounted to said track and defining a viewing aperture for alignment selectively with a selected indicium;

data means comprising a date setting dial adjustably, rotatably mounted to said indicating means, said dial surrounding said viewing aperture;

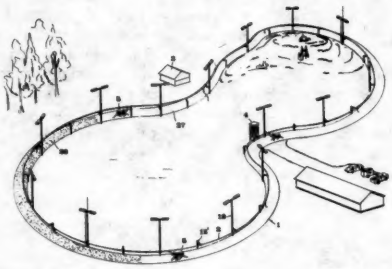
a mark provided on one of said dial and said indicating means, and a plurality of second indicia on the other of said dial and said indicating means, said viewing aperture being selectively slidable into alignment with and to make readily visible from in front of said forward portion a selected first indicium corresponding to the type of food item that is being stored on said food support member and said date setting dial being selectively rotatable to align a selected second indicium with said mark to provde an indication of the time when the food item was stored, whereby through said inventory indicating structure a determination of the length of storage time of the food item can be made without physically examining the item on said support member.

4,619,222

ANIMAL TRAINING COURSE, ESPECIALLY FOR RACE HORSES

Bo Sundberg, and Hans Jonason, both of Sundsvall, Sweden, assignors to HB Autonom

PCT No. PCT/SE84/00204, § 371 Date Jan. 25, 1985, § 102(e) Date Jan. 25, 1985, PCT Pub. No. WO84/04869, PCT Pub. Date Dec. 20, 1984
PCT Filed May 29, 1984, Ser. No. 706,858
Claims priority, application Sweden, Jun. 7, 1983, 8303194
Int. Cl.[4] A01K *29/00*
U.S. Cl. 119—15.5 R **4 Claims**



1. An animal training course, especially for race-horses, comprising:

an endless track;

a guide arranged along said endless track, said guide being rigid and non-yielding;

a plurality of mobile wheel-mounted carriages adapted to travel along said guide, each said carriage including a depending member for tieing an animal to be trained thereto to make the animal along said track by following said carriage;

a connecting means for connecting said plurality of carriages to form a train of said carriages;

wherein said train includes a first, leading carriage and a motor mounted on said first carriage for driving said first carriage and the remaining, trailing carriages of the train along said guide;

a control means for controlling the operation of the train including a transceiver means for transmitting control signals and a receiver means actuated by the signals from said transceiver means for controlling said motor of said first carriage and

a transmitter means attached to the animal for reading physiological measured values of the animal and for transmitting signals indicative of the measured values, said transceiver means being adapted for receiving the transmitted signals of said transmitter means.

4,619,223

PORTABLE CORRAL FOR CATTLE AND THE LIKE

Dennis Koehn, Star Rte. Box 46A, Sublette, Kans. 67877

Filed Apr. 29, 1985, Ser. No. 728,691
Int. Cl.[4] E04H *17/18;* A01K *1/02*
U.S. Cl. 119—20 **6 Claims**

1. A portable corral for cattle and the like which comprises:

(a) a trailer having a front frame, a rear frame and two side frames, said trailer having a first opening in said first side frame and a second opening in said rear frame so that said cattle may enter and egress therefrom;

(b) a solid side cover affixed to said second side frame of said trailer to reduce wind thereof;

(c) at least two wing panel frames, each of which are pivotally coupled to one of said side frames of said trailer;

(d) a plurality of panel frames detachably coupled to said

two wing panel frames and with one another wherein said wing panel frames, said panel frames and said trailer are aligned and combined to constitute said corral for confining said cattle;

(e) a wheel assembly pivotally coupled between said side frames of said trailer so that when said wheel assembly is in an upward position said trailer will sit upon the ground and be used as part of said corral;

(f) a hitch mounted to said front frame of said trailer so that said trailer may be towed by a motor vehicle when said wheel assembly of said trailer is in a downward position;

(g) a pair of gates, each of which are pivotally coupled at one of said openings of said trailer so that when said gates are closed said trailer will be made into a self-sustaining enclosure;

(h) a squeeze gate which is pivotally coupled inwardly at said first opening in said first side frame so that said squeeze gate will divide said trailer into two parts; and

(i) a catch pen being of two sets of panel frames, each said set of panel frames detachably coupled with one another, and between said first opening in said first side frame of said trailer and said motor vehicle so that said cattle may enter said trailer from said motor vehicle.

4,619,224

APPARATUS FOR CONTROLLING DRUM WATER LEVEL OF DRUM TYPE BOILER

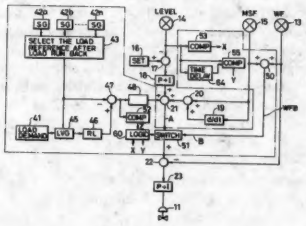
Atsushi Takita, Mito; Akira Sugano, Katsuta, and Naganobu Honda, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 14, 1985, Ser. No. 765,437

Claims priority, application Japan, Aug. 17, 1984, 59-172190

Int. Cl.[4] F22D *5/26*

U.S. Cl. 122—451 R **6 Claims**



1. In an apparatus for controlling the drum water level of a drum type boiler having means for calculating a feed water flow rate demand value on the basis of a drum water level reference signal and a drum water level detecting signal, means for detecting a feed water flow rate, and means for controlling the feed water flow rate on the basis of the deviation of the feed water flow rate detecting signal from said feed water flow rate demand value such that said deviation becomes zero,

an improvement characterized by comprising means for detecting the start of load runback, and means for increasing said feed water flow rate demand value in response to the detection of the start of load runback by said detecting means.

4,619,225

APPARATUS FOR STORAGE OF COMPRESSED GAS AT AMBIENT TEMPERATURE

Frank E. Lowther, Buffalo, N.Y., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed May 5, 1980, Ser. No. 146,634

Int. Cl.[4] F02B *43/08*

U.S. Cl. 123—3 **5 Claims**

1. An engine system including a combustion engine and an oxidizer subsystem for high density gaseous oxidizer, said oxidizer subsystem comprising:

a storage vessel;

adsorbent material in said storage vessel capable of adsorbing relatively large volumes of said gaseous oxidizer at ambient temperature and of preventing the instantaneous release thereof in the event of a rupture of said vessel,

said storage vessel being operatively connected for delivery of oxidizer to said engine for combination with fuel therein to power said engine.

4,619,226

INTAKE DEVICE FOR INTERNAL COMBUSTION ENGINE

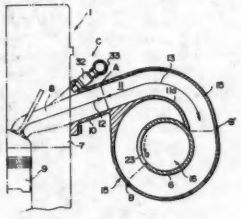
Kazuhiko Ueda; Mitsuo Hitomi, and Junzo Sasaki, all of Hiroshima, Japan, assignors to Mazda Motor Corporation, Japan

Filed Dec. 19, 1984, Ser. No. 683,836

Claims priority, application Japan, Dec. 21, 1983, 58-242698; Dec. 21, 1983, 58-242699; Dec. 28, 1983, 58-248254; Apr. 20, 1984, 59-80919

Int. Cl.[4] F02B *75/06*

U.S. Cl. 123—52 MB **8 Claims**



1. An intake device for an internal combustion engine having a plurality of cylinders comprising a casing having an internal space disposed at one side of the engine, a surge tank which has a cylindrical outer surface and is completely enclosed within the casing for rotation about its longitudinal axis, the surge tank having an opening communicating with atmosphere for drawing air into an internal space of the surge tank, a plurality of separate intake passages which extend from the respective cylinders to an upper portion of the casing and open in an interior space of the casing at respective communicating portions, extensions of the respective separate intake passages are composed of an interior surface of the casing and the cylindrical outer surface of the surge tank which the interior surface of the casing inwardly spirals overlappingly and communicates the respective separate intake passages with an interior space

of the surge tank, hole means formed in the cylindrical surface of the surge tank to communicate each of said extensions with the internal space of the surge tank, and a surge tank driving means for rotating the surge tank about its longitudinal axis to change an effective distance between the hole means of the surge tank and the respective communicating portions according to an operating condition of the engine.

4,619,227

IGNITION DISTRIBUTOR ARRANGEMENT FOR INTEGRAL-COMBUSTION ENGINES

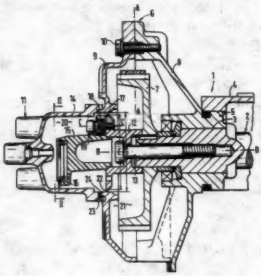
Jürgen Kapfer, Renningen, and Gerhard Kirchdorffer, Weissach-Flacht, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche Aktiengesellschaft, Weissach, Fed. Rep. of Germany

Filed May 14, 1985, Ser. No. 733,784

Claims priority, application Fed. Rep. of Germany, May 23, 1984, 3419184

Int. Cl.[4] F02P *1/00*

U.S. Cl. 123—146.5 A **7 Claims**



1. An ignition distributor arrangement for internal combustion engines, comprising:

a generally cylindrical ignition distributor rotor having a central longitudinal axis of rotation;

means for drivingly attaching the rotor to an end of an engine camshaft such that the central longitudinal axis of the rotor is aligned with a central longitudinal axis of the camshaft, wherein said means for attaching the rotor to the camshaft includes a generally cylindrical cam attached to the end of the camshaft, said cam having a continuous flange extending transversely to the central longitudinal axis of the camshaft, and wherein said rotor is fastened to the flange by fastening means; and

a housing having an opening which surrounds the continuous flange and which has a diameter which is only slightly larger than an outside diameter of the flange, whereby the flange acts as a dust cap to prevent contaminants from passing through the opening.

4,619,228

AUTOMATIC COMPRESSION RELEASE FOR TWO-CYCLE ENGINE

Li-Hsiung Liu, Matthews, N.C., assignor to Textron Inc., Providence, R.I.

Filed Oct. 11, 1984, Ser. No. 659,840

Int. Cl.[4] F01L *9/02, 13/08*

U.S. Cl. 123—182 **18 Claims**

1. An automatic compression release assembly for a two-cycle engine including a cylinder wall, a piston movable within said cylinder wall, a crankcase formed at a first end of said cylinder wall, and means defining a compression release opening at a second end of said cylinder wall, opposite said first end;

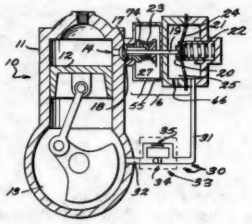
a stationary valve seat operatively connected to said means defining said pressure relief opening, and a movable valve body movable toward and away from said valve seat to selectively allow fluid to flow through said compression release opening and past said valve seat to be exhausted, and to prevent fluid from being exhausted through said pressure relief opening;

a valve actuator member operatively connected to said valve body;

said pressure responsive member defining a first chamber, said pressure responsive member operatively connected to said valve actuator member;

spring biasing means for biasing said actuator member so that said valve body is normally displaced from said valve seat to allow exhausting of fluid through said pressure relief opening; and

means defining a fluid flow path between said crankcase and



said first chamber, said means including a valve means wherein said fluid pressure responsive member comprises a diaphragm, and wherein said actuating member comprises a valve stem integral with said valve body; and further comprising a cap disposed on said valve stem, said cap engaging said diaphragm; and wherein said spring biasing means comprises a first spring disposed in said first chamber and acting on said diaphragm and through said diaphragm on said valve stem to move said valve body to a displaced position with respect to said valve seat, and a second spring having less strength than said first spring, said second spring acting on said valve stem to move said valve body into closed, sealing, relationship with respect to said valve seat.

4,619,229

STRUCTURE FOR COMBUSTION CHAMBER OF AUXILIARY CHAMBER TYPE INTERNAL COMBUSTION ENGINE

Koji Imoto; Mataji Tateishi; Noriyasu Inenaga; Tadao Omura, all of Nagasaki; Hideyuki Ishikawa; Sumio Harada, both of Tokyo; Yuhiko Kiyota, Kyoto; Hiroyuki Kobayashi, Kyoto; Koichi Nakanishi, Kyoto, and Satoru Kume, Kyoto, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha and Mitsubishi Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed Jan. 15, 1985, Ser. No. 691,751

Claims priority, application Japan, Jan. 21, 1984, 59-7943

Int. Cl.[4] F02B *3/00*

U.S. Cl. 123—286 **5 Claims**

1. In a structure for a combustion chamber of an auxiliary chamber type internal combustion engine, including:

a main combustion chamber;

an auxiliary combustion chamber; and

an auxiliary chamber injection port providing communication between said main combustion chamber and said auxiliary combustion chamber, the open end of said auxiliary injection port at the side of said main combustion chamber being formed wholly or mostly in a lower surface of an auxiliary chamber plug,

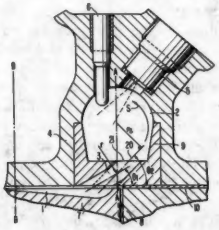
the improvement comprising wherein said auxiliary chamber injection port has a central axis oriented with respect to a center axis of said auxiliary combustion chamber which satisfies the following relationships:

$\theta_1 < \theta_2$;

$20° \leqq \theta_1 \leqq 45°$; and

$35° \leqq \theta_2 \leqq 67.5°$,

wherein the outflow angle of said central axis of said auxiliary chamber injection port at the open end at the side of said auxiliary combustion chamber is designated as θ_2 with respect to a plane normal to said center axis of said auxiliary combustion chamber and wherein the outflow angle of said central axis of said auxiliary chamber injection port at the open end at the side of said main combustion chamber with respect to said plane normal to said center axis of said auxiliary combustion chamber is designated as θ_1.



4,619,230

DEVICE FOR DISCONNECTING THE FEED OF FUEL TO AN INTERNAL COMBUSTION ENGINE

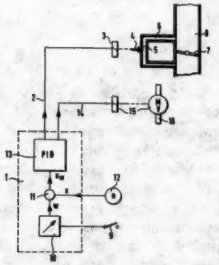
Harald Collonia, Glashütten, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 7, 1983, Ser. No. 472,908

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1982, 3209839

Int. Cl.⁴ F02D *17/04*

U.S. Cl. 123—325 **6 Claims**



1. In a device for disconnecting a feed of fuel to an internal combustion engine, particularly one with an injection pump, upon coasting of an automotive vehicle, having a disconnect member which is controlled as a function of a decrease in speed of the internal combustion engine, particularly a solenoid valve, for disconnecting and reconnecting feeding of the fuel, a valve element for controlling idle speed, and an idle speed controller having a time response with a differential portion, the improvement wherein

said valve element has a continuously variable displacement in response to variation of an electric current of said idle-speed controller, there being a threshold switch activated by said electric current; and

the disconnect member is connected via said threshold switch to an outlet line of the idle-speed controller such that, upon increasing the idling speed by means of the idle-speed controller, the feed of fuel is also connected automatically each time.

4,619,231

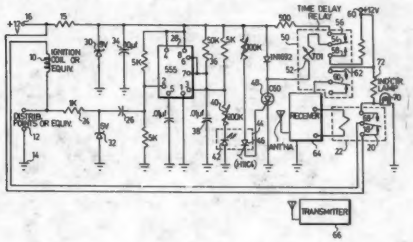
SYSTEM FOR REMOTE DISABLING OF AN INTERNAL COMBUSTION ENGINE

Mike Stolar, Oakville; David B. Robertson, Hamilton, and Mitchell J. Cichy, Pickering, all of Canada, assignors to Safe-T-Stop Inc., Hamilton, Canada

Filed Dec. 26, 1984, Ser. No. 686,369

Int. Cl.⁴ F02D *41/22*; F02P *11/04*

U.S. Cl. 123—333 **13 Claims**



1. A system for the deliberate remote disabling of an internal combustion enginer upon receipt by the engine of a disable signal from a location remote from the engine, the system comprising:

speed detecting and comparison circuit means for connection to the engine to detect the speed thereof and to produce therein a speed signal representative of the current speed or acceleration of the engine; the said circuit means comparing the speed signal with a preset signal value representative of a predetermined speed or acceleration of the engine above which it may be disabled, and producing a receiver enabling signal when the speed signal represents a speed or acceleration greater than the said predetermined value;

a radio transmitter operable by an operator to produce a broadcast disable signal;

a radio receiver connected to the speed detector and comparison circuit means to receive and be enabled by the said enabling signal, and upon receipt of the said broadcast disable signal while enabled producing a disable control signal; and

disabling means for connection to the engine to disable it, the disabling means being connected to the receiver to receive therefrom the disable control signal and upon receipt thereof being operative to disable the engine.

4,619,232

INTERACTIVE IDLE SPEED CONTROL WITH A DIRECT FUEL CONTROL

Robert L. Morris, Plymouth, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed May 6, 1985, Ser. No. 730,912

Int. Cl.⁴ F02D *41/16, 43/00*

U.S. Cl. 123—339 **10 Claims**

1. A method of controlling the idling speed of an internal combustion engine, said method comprising:

generating a speed error signal as a function of the difference between a desired engine idle speed and the actual engine idle speed;

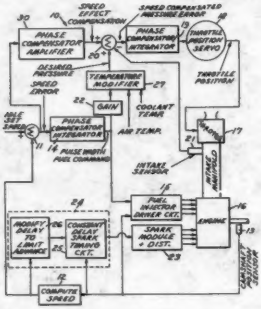
generating a fuel pulse width command signal to control a fuel mass charge as a function of the speed error signal;

generating a throttle command signal as a function of the fuel mass charge to maintain a desired air to fuel ratio;

generating a spark advance;

phase compensating the speed error signal with respect to time;

generating a pressure error signal as the difference between a desired engine manifold pressure and an actual engine manifold pressure where desired engine manifold pressure is proportional to fuel charge and a function of air and coolant temperature;



phase compensating the pressure error signal with respect to time; and wherein

generating a fuel pulse width command signal includes summing a first signal proportional to the phase compensated speed error signal and a second signal proportional to the time integral of the speed error; and

generating a throttle command signal includes summing a first signal proportional to the phase compensated pressure error signal and a second signal proportional to the time integral of the pressure error.

4,619,233

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

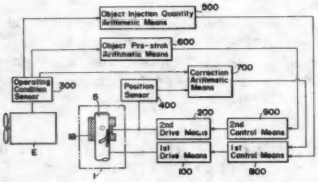
Susumu Yamaguchi, Higashi-Matsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Tokyo, Japan

Filed Jun. 18, 1985, Ser. No. 746,115

Claims priority, application Japan, Jun. 29, 1984, 59-98163[U]

Int. Cl.[4] F02D *31/00*

U.S. Cl. 123—357 **3 Claims**



1. A fuel injection system for an internal combustion engine, comprising:

(a) a fuel injection pump driven by the engine for fuel injection thereto and including a plunger reciprocably movable at a non-uniform speed and a control sleeve slidably fitted on said plunger;

(b) first drive means operatively connected with said plunger for rotating the latter to thereby adjust the effective stroke of said plunger;

(c) second drive means operatively connected with said control sleeve for displacing the latter in an axial direction to thereby adjust the pre-stroke of said control sleeve;

(d) an operation sensor for detecting operating conditions of the engine;

(e) a position sensor for detecting a position of said control sleeve;

(f) first arithmetic means responsive to the engine operating conditions detected by said operation sensor, for computing an object injection quantity;

(g) second arithmetic means responsive to the position of said control sleeve detected by said position sensor, for computing an object pre-stroke of said plunger;

(h) third arithmetic means responsive to the engine operating conditions detected and the position of said control sleeve detected, for computing a correction amount;

(i) first control means responsive to said correction amount computed by said third arithmetic means, for correcting said object injection quantity and for delivering a control signal to said first drive means; and

(j) second control means responsive to the object injection quantity computed by said second arithmetic means, for delivering a control signal to said second drive means.

4,619,234

ELECTRONICALLY CONTROLLED FUEL INJECTION APPARATUS

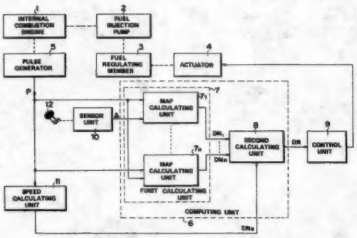
Kenji Okamoto, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed Jul. 2, 1985, Ser. No. 751,079

Claims priority, application Japan, Jul. 3, 1984, 59-136584

Int. Cl.[4] F02D *41/38;* **F02M** *59/20*

U.S. Cl. 123—357 **7 Claims**



1. An electronically controlled fuel injection apparatus having a fuel injection pump for supplying fuel to an internal combustion engine, an actuator for controlling the operating position of a fuel regulating member for the fuel injection pump, means for producing a condition signal indicating the operating condition of the internal combustion engine, computing means for calculating target data relating to a target amount of fuel injection in response to the condition signal, and means for driving said actuator so as to obtain said target amount of fuel injection in response to the result of the calculation from said computing means, in which said computing means comprises first calculating means for performing two dimensional map calculation in response to the condition signal so as to obtain plural sets of data pairs, one member of each pair being indicative of the operating position of said fuel regulating member and the other member thereof being indicative of the corresponding engine speed;

means for generating speed data relating to the speed of the internal combustion engine; and

second calculating means responsive to the speed data for carrying out an interpolation calculation once every predetermined degree of rotation of said internal combustion engine, the interpolation calculation being carried out on the basis of the plural sets of data pairs obtained from said first calculating means in order to obtain data relating to

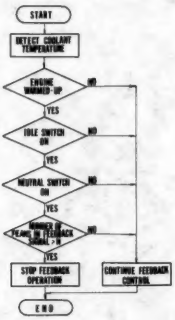
the target amount of fuel injection at the engine speed at each instant.

4,619,235

AIR-FUEL RATIO CONTROL SYSTEM

Ryuji Kataoka, Mitaka, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 11, 1985, Ser. No. 710,183
Claims priority, application Japan, Mar. 14, 1984, 59-49581
Int. Cl.[4] F02D *41/14*
U.S. Cl. 123—440 **2 Claims**



1. In an air-fuel ratio control system for an automotive engine mounted on a vehicle, having a transmission, a fuel control device, a feedback control system responsive to the output of an O_2-sensor for producing a feedback signal having a plurality of voltage peaks for operating the fuel control device, the improvement comprising:

first means for detecting the idling condition of the engine and for producing a first signal;

second means responsive to the first signal for starting counting the number of the peaks in the feedback signal of the feedback control system and for producing a second signal when the count exceeds a predetermined value;

third means responsive to the second signal for producing an output to fix the feedback control system to a predetermined value.

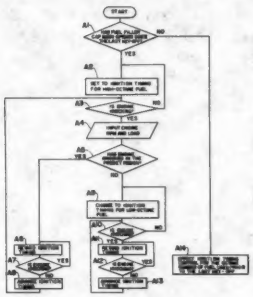
4,619,236

CONTROL APPARATUS OF INTERNAL COMBUSTION ENGINE

Tooru Okada, Kameoka; Takanao Yokoyama, Nagaokakyo; Atsushi Ueda, and Toshio Iwata, both of Himeji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha and Mitsubishi Denki Kabushiki Kaisha, both of Tokyo, Japan

Filed Sep. 26, 1984, Ser. No. 655,022
Claims priority, application Japan, Sep. 30, 1983, 58-182502
Int. Cl.[4] F02P *5/15*; F02D *43/00*
U.S. Cl. 123—425 **18 Claims**

1. A control apparatus for an internal combustion engine comprising a base ignition timing information generating means for generating a plurality of base advance informations according to octane number of fuel being used in said internal combustion engine, a knock detecting means for detecting a knocking condition of said internal combustion engine, an operating condition detecting means for detecting an operating condition of said internal combustion engine, a fuel distinguishing means for determining said fuel being used in said internal combustion engine on the basis of detection results by said knock detecting means and detection results by said operating condition detecting means, a base ignition timing setting means adapted to be operated on the basis of detection results by said fuel distinguishing means to obtain base ignition timing information in accordance with octane number of fuel determined by said fuel distinguishing means from base ignition timing informations by said base ignition timing information generating means, thereby setting the base ignition timing of said internal combustion engine according to information obtained,



and a knock control means for retarding said ignition timing set by said base ignition timing setting means on the basis of an output from said knock detecting means when said internal combustion engine knocks, thereby suppressing generation of knocking.

4,619,237

ENGINE COLD STARTING

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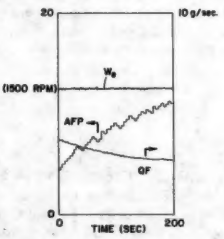
Continuation-in-part of Ser. No. 677,892, Dec. 4, 1984, abandoned, which is a continuation of Ser. No. 497,894, May 25, 1983, abandoned. This application Nov. 18, 1985, Ser. No. 799,277
Int. Cl.[4] F02D *11/10*
U.S. Cl. 123—491 **4 Claims**



1. An optimum control method for starting and idling a cold internal combustion engine which controls the feed of both fuel and air by a computer control unit, comprising,

maintaining the engine r.p.m. at a predetermined value when the temperature of the engine is below a predetermined value and when the engine is idling,

changing the air-fuel ratio in the direction where fuel consumption is expected to decrease,

such changing being made after comparing fuel consumption at this sampling time with fuel consumption at the last sampling time and being due to the direction of the air-fuel ratio change at the last sampling time.

4,619,238
FUEL INJECTION PUMP FOR INTERNAL COMBUSTION ENGINES

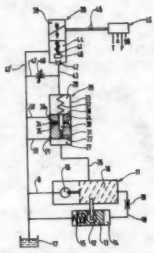
Josef Hain, Leonberg, and Karl-Friedrich Rüsseler, Ditzingen, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,293

Claims priority, application Fed. Rep. of Germany, Mar. 20, 1984, 3410146

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—502 **4 Claims**



1. In a fuel injection pump for internal combustion engines, comprising a fuel feeding pump driven synchronously with the injection pump and having a pressure side; an adjusting piston loaded with a restoring spring force and adapted to adjust an injection start, said adjusting piston forming in said injection pump a working chamber which is in connection with said pressure side; a pressure-relief chamber; a pressure control valve including a movable control piston and having an outlet opening controlled by said control piston, said pressure side being further connected with said pressure-relief chamber via said outlet opening for generating a control pressure depending upon a number of revolutions, said control piston having a backside loaded with a restoring spring force, said pressure control valve having a pressure control chamber at said backside; a throttle conduit connecting said pressure control chamber with the pressure side of said feeding pump; a pressure-relief conduit connecting said pressure control chamber with said pressure-relief chamber; and a check valve mounted in said pressure relief conduit and being controllable in dependence upon operational parameters of an internal combustion engine, the improvement comprising a bypass conduit arranged parallel to said check valve and provided with a flow valve formed as a throttle valve, said bypass conduit connecting said pressure control chamber of the pressure control valve with said pressure-relief chamber.

4,619,239
FUEL INJECTION ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Gerd Wallenfang; Reda Rizk, both of Cologne, and Hans-Gottfried Michels, Erftstadt, all of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed Jan. 25, 1984, Ser. No. 573,803

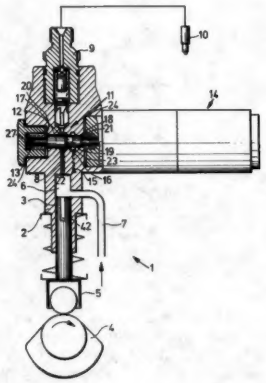
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1983, 3302294

Int. Cl.[4] F02M *39/00*

U.S. Cl. 123—506 **24 Claims**

1. A fuel injection arrangement for an air-compressing, spontaneous ignition, internal combustion engine; said arrangement includes at least one electromagnetic control valve, via which a high-pressure channel associated with a fuel injection pump, which is provided with an intake line, can be connected with a low-pressure channel; said control valve includes a valve body which is in the form of a piston valve and is spring-loaded; said piston valve has a high-pressure end and a low-pressure end, and two end faces; said piston valve is axially movable in a first chamber which includes at least one high-pressure connection associated with said high-pressure channel and said high-pressure end of said piston valve, and at least one low-pressure connection associated with said low-pressure channel and said low-pressure end of said piston valve; said piston valve is in operative connection with an electromagnetic adjusting device;

the improvement comprises the provisioning of said piston valve with a valve seat for delimiting that piston valve region on said high-pressure end of said piston valve; said last-mentioned region has a fixed diameter which corresponds to the diameter of said valve seat, and that piston



valve region on said low-pressure end of said piston valve has a diameter which is less than said fixed diameter;

said first chamber including a second chamber, which is associated with said high-pressure end of said piston valve and one of said end faces thereof, and a third chamber, which is associated with said low-pressure end of said piston valve and the other one of said end faces thereof;

at least one line for connecting said high-pressure second chamber and said low-pressure third chamber;

that piston valve region on said low-pressure end of said piston valve being provided with a fourth chamber which begins at said valve seat, and cooperates with said low-pressure connection of said first chamber.

4,619,240
FUEL OIL INJECTION ENGINE

Timothy J. Bedford, Burton-on-Trent, England, and Paul J. O'Sullivan, West Vancouver, Canada, assignors to Anker Gram & Associates Ltd., W. Vancouver, Canada

Filed Oct. 31, 1983, Ser. No. 547,593

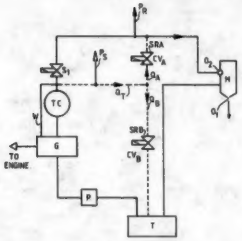
Claims priority, application United Kingdom, Oct. 30, 1982, 8231093

Int. Cl.[4] F02B *13/00*

U.S. Cl. 123—575 **42 Claims**

1. In a dual-fuel engine having at least one combustion chamber and a fuel oil injection supply system and being adapted to run on fuel oil alone in a single-fuel mode and in a dual-fuel mode on fuel oil and gas, the combination comprising:

(a) a reference supply line located in the fuel oil injection supply system of the engine for carrying the fuel oil,



(b) means responsive to the fuel oil pressure developed in the reference supply line for automatically controlling the flow of fuel oil and gas to said combustion chamber.

4,619,241

HIGH-ENERGY IGNITION DEVICE

Takashi Yoshinari, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

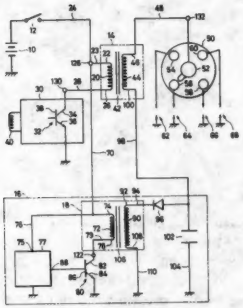
PCT No. PCT/JP84/00429, § 371 Date May 9, 1985, § 102(e) Date May 9, 1985, PCT Pub. No. WO85/01323, PCT Pub. Date Mar. 28, 1985

PCT Filed Sep. 7, 1984, Ser. No. 734,277

Claims priority, application Japan, Sep. 9, 1983, 58-165175

Int. Cl.⁴ F02P *1/00*

U.S. Cl. 123—620 **4 Claims**



1. A high-energy ignition device for an engine, the high energy ignition device comprising:

a pickup for generating an output synchronous with operations of the engine;

an ignition circuit including a switching device adapted to be turned on and off in accordance with the output from said pickup;

an igniter coil including a primary coil connected to said switching device, a secondary coil in which a high voltage is generated in response to an abrupt turning on and off of electric current in said primary coil, and an iron core between said primary and secondary coils; and

a DC-DC converter including a transformer including by a primary coil, a secondary coil and an iron core between said primary and secondary coils, a switching element connected in series to said primary coil, and an oscillator for turning said switching element on and off at a predetermined frequency, said DC-DC converter being adapted to produce, at the output side of said secondary coil, a DC voltage lower than the pulse voltage generated by said igniter coil and adapted to be superposed on the current produced by said igniter coil;

said igniter coil, said output transformer of said DC-DC converter, a first line connected between one end of said secondary coil of said output transformer and ground, a diode having a cathode connected to the other end of said secondary coil of said transformer, a smoothing capacitor one end of which is connected to an anode of said diode, a second line connected between the other end of said capacitor and ground, and a third line connected between said anode of said diode and one end of said secondary coil of said igniter coil, are integrated with a forming resin for facilitating a sufficiently strong insulation.

4,619,242

HEAT TRANSFER AND CONDITIONING UNIT

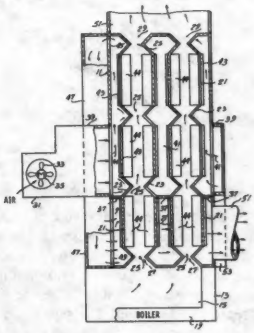
Robert J. Smith, 4511 E. Snover Rd., Silverwood, Mich. 48760

Continuation of Ser. No. 949,680, Oct. 10, 1978, abandoned. This application Feb. 13, 1984, Ser. No. 579,395

The portion of the term of this patent subsequent to Oct. 10, 1995, has been disclaimed.

Int. Cl.⁴ F24H *3/10*

U.S. Cl. 126—110 R **1 Claim**



1. A heat transfer and conditioning unit connectively joining a fire chamber and an exhaust flue having an independent chamber for circulation of ambient air capable of transferring heat thereto comprising:

a casing having a plurality of exhaust inlets and a plurality of exhaust outlets adapted for communication with a flue to the atmosphere;

the casing containing a plurality of adjacent walls, the opposing surfaces of said walls defining elongated passages arranged in longitudinal alignment for conducting exhaust gas containing products of combustion between said exhaust inlets and outlets;

said walls being formed of a material suitable for the conductance of heat;

each elongated passage having a passage inlet adjacent to the exhaust inlet and a passage outlet adjacent to the exhaust outlet, walls disposed parallel to each other and a plurality of venturi, the venturi located at each passage inlet and outlet and periodically disposed along the elongated passage, each venturi separated from adjacent venturi by portions of the wall disposed parallel to each other, the venturi and parallel portions of the wall defining a plurality of compartments;

the compartments containing a series of longitudinally and laterally extending fins;

the casing having an air inlet and an air outlet and a continuous chamber for the passage of ambient air between said air inlet and said air outlet;

said continuous chamber for the passage of said ambient air being formed by the outer surfaces of said walls of the elongated passages and portions of said casing such that

said continuous chamber is bordered for a substantial portion of its length by the walls of said elongated passages whereby a larger percent of the exhaust gas exhausted through said passages remains in contact with the compartment walls of said passage for a greater amount of time for transferring heat to said ambient air.

4,619,243

APPARATUS FOR THE CAPTURE AND TRANSFER OF RADIATION ENERGY SUCH AS SOLAR RADIATION

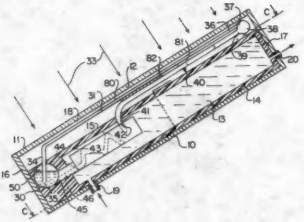
Pierre Vironneau, 2, Rue Jean-Moulin, 31120 Portet-sur-Garonne, and Jean Prunet, Domaine de la Terrasse, 31450 Montgiscard, both of France

Filed Jun. 25, 1985, Ser. No. 748,614

Claims priority, application France, Jun. 25, 1984, 84 10563

Int. Cl.[4] F24J *2/32*

U.S. Cl. 126—433 **7 Claims**



1. Apparatus for the capture and transfer of radiation emitted in a non-continuous manner, comprising:

a first circuit, a first fluid having a quality of high volatility in said first circuit, said first circuit comprising, mounted in series, a reservoir of said first fluid in liquid phase and channels adapted to be subjected to said radiation to take on at least two tempertures t1 and t4 according to the presence or absence of radiation, respectively, t4 being less than t1, and a recovery conduit,

a second circuit, a second fluid in said second circuit, said second circuit being substantially thermally insulated,

a fluidic heat exchanger of at least one first and one second path, the first path being mounted in series in said recovery conduit, and the second path in said secondary circuit, in such a manner that said second fluid is brought to a temperature t2 between t1 and t4, when the said channels subjected to the radiation are brought to the temperature t1, and

means for maintaining the part of the said recovery conduit mounted between the said channels and the said first path of the exchanger at a temperature t3 having a non-continuous value between t2 and t4.

4,619,244

SOLAR HEATER WITH CAVITY AND PHASE-CHANGE MATERIAL

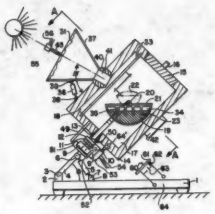
Alvin M. Marks, Bigelow Rd., Athol, Mass. 01331

Continuation-in-part of Ser. No. 479,091, Mar. 25, 1983, abandoned. This application Feb. 17, 1984, Ser. No. 581,265

Int. Cl.[4] F24J *2/02*

U.S. Cl. 126—451 **1 Claim**

1. A solar heating device comprising an insulating chamber, an aperture on said chamber, sunfollowing means for concentrating and focussing sunlight through said aperture into said chamber, a platen in said chamber, a heat-conductive ribbed element attached to a surface on said platen, a phase-change material, a container for said phase-change material, said platen being sealed to said container, said ribbed element dipping into said phase-change material, an air space above said phase-change material, said phase-change material melting at a temperature suitable for cooking food, whereby heat is provided



to said platen to increase and maintain the said temperature of the said platen within the said chamber.

4,619,245

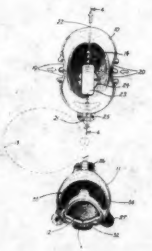
MECHANICAL PROSTHETIC SPHINCTER

Terry M. Haber, Lake Forest, and William H. Smedley, Mission Viejo, both of Calif., assignors to Habley Medical Technology Corporation, Laguna Hills, Calif.

Filed Aug. 11, 1983, Ser. No. 522,107

Int. Cl.[4] A61B *19/00*

U.S. Cl. 128—1 R **22 Claims**



1. A mechanical prosthetic sphincter for controlling an elimination passage of a patient for realizing continence, including in combination:

(a) a manually controllable actuating component in the form of a ring having pressure receiving surfaces on two diametrically opposite portions, the manual squeezing of said pressure receiving surfaces moving said opposite portions towards each other causing two other diametrically opposite portions of said ring to move away from each other such that the ring assumes an oval shape;

(b) a responsive component having an occlusion orifice for surrounding said elimination passage;

(c) a flexible force-applying means in the form of a cable having a first end passing through one of said two other portions of the ring and terminating in the other of the two other portions of the ring so that squeezing the pressure receiving surfaces of the ring pulls a portion of the cable into the ring and releasing the pressure receiving surfaces permits said portion to move in an opposite direction, the second end of the cable connecting to a wall of said occlusion orifice in said responsive component such that a pulling force on said second end of said cable expands said occlusion orifice and a movement of the cable in an opposite direction results in a contraction of said orifice; and

(d) releasable retaining means in said ring for holding the portion of the cable pulled into the ring as a result of squeezing the pressure receiving surfaces so that the occlusion orifice is held in its expanded condition automati-

cally until such time as said retaining means is intentionally released.

4,619,246

COLLAPSIBLE FILTER BASKET

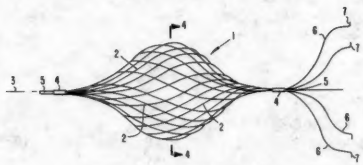
Arne Molgaard-Nielsen, Copenhagen, Denmark, and Rolf Günther, Aachen, Fed. Rep. of Germany, assignors to William Cook, Europe A/S, Bjaeverskov, Denmark

Filed May 20, 1985, Ser. No. 736,147

Claims priority, application Denmark, May 23, 1984, 2529/84

Int. Cl.[4] A61M *29/00*

U.S. Cl. 128—1 R **48 Claims**



1. A collapsible filter basket adapted to be introduced into a blood vessel of a patient, comprising a plurality of resilient wires interconnected at their respective ends, said basket in its expanded and relaxed state assuming the shape of an apertured, elongate solid of revolution with pointed ends and having a length as measured between the pointed ends at least equal to the maximum diameter thereof.

4,619,247

CATHETER

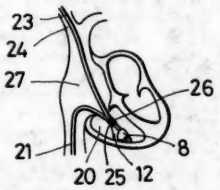
Kiyoshi Inoue, Urawa; Keiichi Kuwaki, Tokyo, and Koichi Tsuno, Osaka, all of Japan, assignors to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Mar. 23, 1984, Ser. No. 592,719

Claims priority, application Japan, Mar. 31, 1983, 58-56629; Sep. 26, 1983, 58-178730; Dec. 16, 1983, 58-238329

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—6 **1 Claim**



1. An optical catheter comprising a first flexible tube supporting at least one optical transmission means terminating adjacent an open end of said tube, an inflatable, transparent balloon fixed relative to said open end of said first flexible tube, said balloon extending across the field of said optical transmission means when said balloon is inflated whereby light rays passing between an area to be examined and said optical transmission means must pass through said balloon, a first permanent magnet fixed to said first tube in proximity to said balloon, and a second flexible tube for delivering a flusing spray of fluid between the exterior of said balloon and the area to be inspected for preventing direct contact between said balloon and said area to be inspected and for removing obstructing materials from the field through which light rays pass, a second permanent magnet affixed to the end of said second flexible tube for attraction to said first permanent magnet for securing said flexible tubes together.

4,619,248

LIGHT ATTACHMENT FOR SPECULUM

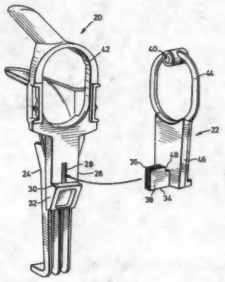
David J. Walsh, 2512 Mississauga Road, Mississauga, Ontario, Canada (L5H 2L5)

Filed Aug. 19, 1985, Ser. No. 767,208

Claims priority, application Canada, Aug. 22, 1984, 461581

Int. Cl.[4] A61B *1/06, 1/30*

U.S. Cl. 128—18 **5 Claims**



1. A lighting attachment for use with a speculum of the type comprising first and second parts movable relative to one another to dilate a body opening for examination, the first part having a first handle portion defining a slot and a first deflector extending generally perpendicularly from the first handle portion, the second part having a pair of parallel fingers including locating detents, the fingers being engaged in the slot and defining between them an outwardly opening recess, the second part also having a second deflector extending generally parallel to the first deflector with the fingers out of the slot and movable angularly away from the first deflector causing the fingers to move into the body opening, the fingers then being deflected slightly towards one another to bias the detents to hold the fingers in the slot, the lighting attachment comprising:

an elongate casing having a main portion and a hoop lying generally in the same plane as the main portion;

an electrical energy source contained in the main portion;

a light emitter attached to the hoop at a location diametrically opposite the main portion;

circuit means coupling the light emitter to the electrical energy source and including switch means for energizing the light emitter; and

the switch means comprising a pair of conductors normally spaced from one another and proportioned for engagement in the recess so that with the fingers deflected, the conductors are flexed towards and into engagement with one another to thereby switch on the light emitter and project light between the deflectors to illuminate the body opening for examination by viewing through the hoop.

4,619,249

TRANSCUTANEOUS INTRAVENOUS ILLUMINATOR

Kim Landry, 2731 Blairstone Rd., Apt. #80, Tallahassee, Fla. 32301

Filed Jul. 24, 1985, Ser. No. 758,399

Int. Cl.[4] A61B *1/06*

U.S. Cl. 128—23 **5 Claims**

1. A transcutaneous illuminating apparatus comprising:

a. a housing having a source of electrical energy provided therein;

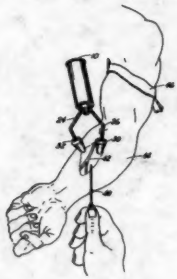
b. means removably mounted on one end of said housing for pivotally supporting a plurality of tubular members at their proximate end, each of said tubular members having mounted on its distal end illuminating means;

c. an electrical circuit including said source of power and said illuminating means;

d. means for selectively completing the circuit between said

illuminating means and said source of electrical energy, thereby activating said illuminating means;

e. means provided in said circuit for selectively varying the intensity of each of said illuminating means; and



f. means for applying each of said illuminating means to the tissue area to be inspected.

4,619,250

THERAPEUTIC APPLIANCE FOR IMPROVING FUNCTIONS OF HAND FINGERS

Tsuneo Hasegawa, Tokyo, Japan, assignor to Man Design Co., Ltd., Tokyo, Japan

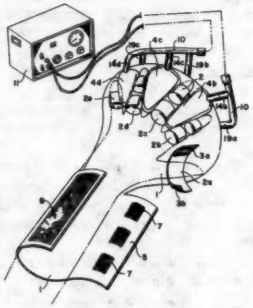
Filed Oct. 12, 1984, Ser. No. 660,046

Claims priority, application Japan, Oct. 14, 1983, 58-192254

The portion of the term of this patent subsequent to Jun. 11, 2002, has been disclaimed.

Int. Cl.[4] A61H *1/02*

U.S. Cl. 128—26 **7 Claims**



1. A therapeutic appliance for improving the functions of an individual's carpal joints, hands and fingers comprising;

a splint cloth including a palm splint cloth shaped so as to accommodate a palm with its fingers spread apart and a forearm splint cloth extending from the palm splint cloth so as to cover the carpal joint and at least a portion of the forearm;

finger retainer means disposed on a front surface of the splint cloth for holding the fingers individually in their spread apart positions;

a plurality of first bladders disposed on the front surface of said palm splint cloth and positioned between each adjacent fingers except between the thumb and forefinger in a palmiped configuration for spreading the fingers apart from each other;

a plurality of second bladders disposed on the opposite surface of said palm splint cloth for extending the fingers, hand and the carpal joint; and

fluid supply and discharge tubes connected to said first and second bladders for supplying and discharging fluid to and from the bladders;

whereby operations of supplying fluid simultaneously to all of the bladders or selectively to any selected one or more of the bladders through said tubes and discharging the fluid from the bladders through the tubes after a predetermined period of time may be repeated to impart extending and opening motions to the functionally incapacitated carpal joint, hand and fingers forcedly, rythmically and intermittently to thereby remedy the bending contracture and dysfunction in extending motion as well as to create a motive for triggering self-motivating capacity.

4,619,251

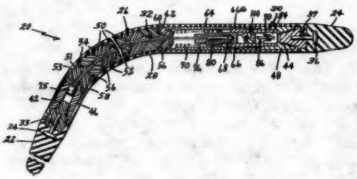
PENILE PROSTHESIS HAVING AN ACTUATOR MEANS INTERACTING WITH A MEMBER AND ARTICULATED COLUMN

Richard A. Helms, Elk River, Minn.; Gerald W. Timm, San Juan Capistrano, Calif., and Donald L. Sandford, Lauderdale, Minn., assignors to Dacomed Corporation, Minneapolis, Minn.

Continuation-in-part of Ser. No. 604,022, Apr. 26, 1984, Pat. No. 4,541,420. This application Sep. 13, 1985, Ser. No. 775,782

Int. Cl.[4] A61F *5/00*

U.S. Cl. 128—79 **13 Claims**



1. A penile prosthesis, comprising:

(a) an elongated cylindrical body having a longitudinal axis and further having a distal end portion and a proximal end portion, said elongated cylindrical body including an outer elongated sheath formed from a physiologically inert and pliable material;

(b) an articulated column of radiused segments disposed intermediate of said distal end portion and said proximal end portion, the radiused segments having a concave surface portion proximate one end and a convex surface portion proximate an opposite end, the facing concave and convex surfaces of adjacent ones of the radiused segments cooperating to form ball and sockets joints between adjacent ones of the radiused segments, a shoulder portion being positioned about a periphery of each of the concave and convex surfaces, the facing shoulder portions of adjacent ones of the segments cooperating to limit the amount of bending movement which occurs between adjacent ones of the segments;

(c) an elongated tension member extending longitudinally of the elongated cylindrical body, the tension member being secured proximate first and second ends to proximate the distal end and proximal end portions of the prosthesis; and

(d) switch means enclosed within the sheath for switching the prosthesis between a rigid state and a flexible state, the switch means cooperating with the tension member and the articulated column for increasing the tension in the tension member and compressing the articulated column when switching the prosthesis to the rigid state.

4,619,252

THERAPEUTIC METHOD AND THERAPEUTIC MEANS USING A SHEETLIKE BATTERY

Jack K. Ibbott, 17-7, Nishiazabu 4-chome, Minato-ku, Tokyo 106, Japan

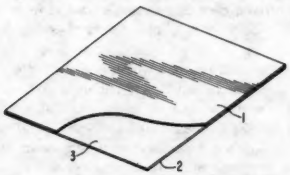
PCT No. PCT/JP84/00193, § 371 Date Dec. 13, 1984, § 102(e) Date Dec. 13, 1984, PCT Pub. No. WO84/04045, PCT Pub. Date Oct. 25, 1984

PCT Filed Apr. 16, 1984, Ser. No. 683,462

Claims priority, application Japan, Apr. 15, 1983, 58-65624; Feb. 8, 1984, 59-20101

Int. Cl.[4] A61N *1/24*

U.S. Cl. 128—82.1 27 Claims



1. A therapeutic apparatus for treating an affected part of a human body, said apparatus comprising:

a sheetlike battery including opposite surfaces defining positive and negative electrodes and having flexibility and cutting characteristics similar to paper;

said sheetlike battery being cut to form a sheetlike battery piece of a size and shape for fitting over an affected body part to be treated; and

means for attaching said battery piece to the affected body part and thereby for forming an electric, current-conducting circuit between said battery and skin of the affected body part by means of contact therewith of body moisture.

4,619,253

FOIL- OR FILM-LIKE BANDAGE AND PROCESS FOR USING THE SAME

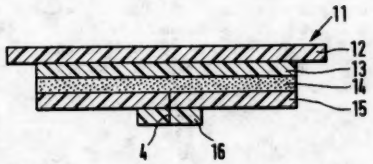
Dieter Anhäuser, Melsbach; Gerhard Kreitlow; Hubertus Olbrich, both of Neuwied; Karl-Heinz Reinhold, Hausen, and Anita Schmitt, Rossbach, all of Fed. Rep. of Germany, assignors to Lohmann GmbH & Co. KG, Neuwied, Fed. Rep. of Germany

Filed Dec. 6, 1984, Ser. No. 678,782

Claims priority, application Fed. Rep. of Germany, Dec. 8, 1983, 3344334

Int. Cl.[4] A61L *15/00;* E04F *15/16;* B32B *27/00*

U.S. Cl. 218—156 11 Claims



1. A foil- or film-like bandage consisting of a transparent continuous foil or film having a thickness of 10 to 120 μm covered on one side by a transparent supporting foil bonded thereto and on its other side by an adhesive layer which itself is covered by a removable cover layer, said supporting foil extending beyond the edges of the foil or film layer at two opposite edges thereof, thereby forming two grasp strips, said removable cover layer being the same size as the adhesive layer and having a precut or breaking line partitioning said cover layer into two partial areas thereby forming at least one peelable grasp part for each partial area, whereby bending the bandage to a convex curvature of the grasp part area produces peel-off of said grasp parts.

4,619,254

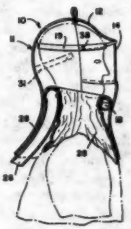
PROTECTIVE RESPIRATOR HOOD WITH INNER AND OUTER BIBS

Anthony L. Moretti, San Rafael, and Anselmo P. Pellolio, Jr., Cotati, both of Calif., assignors to E. D. Bullard Company, Sausalito, Calif.

Continuation-in-part of Ser. No. 457,527, Jan. 13, 1983, Pat. No. 4,484,575. This application May 29, 1984, Ser. No. 615,090

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—201.23 7 Claims



1. In a head mounted hood including a hollow generally tubular body portion with a closed end and an open end made of flaccid, non-stretchable, air-impervious material dimensioned to enclose the head and neck of the wearer and having an optical lens panel interposed in the wall adjacent said closed end thereof, the improvement comprising an elongated open ended generally tubular bib structure of flaccid, non-stretchable, air-impervious material dimensioned to be received over the head of the wearer and having one end sealingly affixed about the inner surface of said tubular body portion intermediate said closed end and said open end thereof on the opposite side of said optical lens panel from said closed end of said tubular body portion, said tubular bib structure extending in overlapping substantially coaxial relation within said tubular body portion and projecting a substantial distance from said open end thereof, and including an opening through said tubular bib structure beneath said optical lens panel, centered with respect to said optical lens panel and spaced from said one end of said tubular bib structure, and the opening being dimensioned to receive the intake port and exhaust port of a face mask therethrough and having an elastic band structure sealingly affixed about the periphery thereof in an expanded state.

4,619,255

OXYGEN SUPPLY SYSTEM

Dominic J. Spinosa, Wantagh, and Frank Knoll, Huntington Station, both of N.Y., assignors to East/West Industries, Inc., Hauppauge, N.Y.

Continuation-in-part of Ser. No. 321,420, Nov. 16, 1981, abandoned. This application Jul. 19, 1984, Ser. No. 632,381

Int. Cl.[4] A62B *7/00*

U.S. Cl. 128—202.27 26 Claims

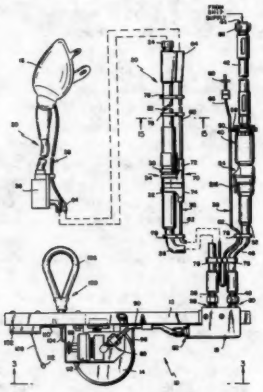
1. An emergency oxygen supply system for use on an aircraft having an ejection seat, a primary oxygen supply source, an emergency oxygen supply means, and an oxygen mask disposed on said aircraft for supplying oxygen to aircraft personnel disposed upon said ejection seat through said oxygen mask or the like, upon failure of said primary oxygen supply, said system comprising in combination:

(A) differential pressure activated valve means adapted to be affixed to said ejection seat and having an elongated chamber with two input ports and an output port in communication with said elongated chamber,

(i) one of said input ports adapted to be in communication with said primary oxygen supply source and the other of said input ports adapted to be in fluid communication with said emergency oxygen supply means, and said output port adapted to be in communication with said

oxygen mask, two of said ports being spaced apart along the longitudinal axis of said chamber, and the third port being disposed on one end of said chamber forming one of said input ports of said differential pressure valve means, said port furthermost from said one end of said chamber forming a longitudinal input port of said differential pressure valve means, the remaining port forming the output port of said differential pressure valve means,

(ii) a valve shuttle disposed in said elongated chamber dimensioned to freely reciprocate from a first position wherein said valve shuttle permits communication only between said longitudinal input port and said output port and a second position wherein said valve shuttle permits fluid communication only between said input port and said output port, said valve shuttle being an elongated hollow cylinder having an open end and a closed end and having at least one through aperture disposed in said cylinder wall, said valve shuttle being disposed within said elongated chamber formed by said housing such that said open end of said valve shuttle is oriented toward said end input port, said cylinder having an O-ring washer fitted thereon proximate said closed end forming a valve poppet, and said walls of said longitudinal chamber dimensioned to permit free movement of said shuttle between said first and said



second positions such that when said shuttle is in said first position said poppet seals said chamber for fluid communication only between said longitudinal input port and said output port, said walls of said longitudinal chamber further forming a complementary valve seat circumferentially disposed between said input port and said output port isolating said longitudinal input port from said output port such that disposition of said valve shuttle in said second position causes said valve poppet to seat on said valve seat so that said end input port is in fluid communication only with said output port through said at least one through aperture disposed in said valve shuttle wall; and

(iii) biasing means for biasing said valve shuttle in said first position whereby a first condition is provided wherein only the oxygen from said primary oxygen supply source is provided to said oxygen mask unless the pressure at said input port exceeds the pressure of said longitudinal input port by a predetermined value greater than the force of said biasing means whereby a second condition is provided in which only the oxygen from said emergency oxygen supply means is provided through a completed emergency fluid flow path to said oxygen mask, said differential pressure activated means changing from said first condition to said second condition by a change in the pressure differential between said valve input ports;

(B) means defining a primary fluid flow path having one end connected to said longitudinal input port of said differential pressure activated valve means and an opposite end adapted to be connected to said primary oxygen supply source, a quick disconnect means disposed within said primary fluid flow path and including check valve means for blocking the oxygen flow in said primary fluid flow path from said primary oxygen source when disconnected;

(C) emergency oxygen supply means having a pressure greater than said primary oxygen supply source adapted to be affixed on said ejection seat and in communication with the other of said input ports of said differential pressure activated valve means providing said emergency fluid flow path therebetween; and

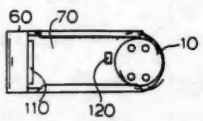
(D) oxygen release valve means adapted to be affixed to said ejection seat provided with cooperating actuation means adapted to be connected to said aircraft and manual actuation means for manually activating said release valve means and disposed in said emergency fluid flow path, said oxygen release valve means permitting oxygen to flow in said emergency fluid flow path to the other of said input ports of said differential pressure activated valve means when manually activated and when said ejection seat is activated.

4,619,256

INTRAOCULAR LENS INSERTING ASSEMBLY

Gerald Horn, 5415 W. Sheridan Rd., Chicago, Ill. 60640

Filed Sep. 8, 1982, Ser. No. 415,806
Int. Cl.[4] A61B *17/00;* A61F *2/16*
U.S. Cl. 128—303 R **4 Claims**



1. An assembly for inserting an intraocular lens with haptics into an eye, comprising:

a first member having a first member bottom with two sides and two opposing walls disposed along said sides structured and arranged to hold said lens therebetween; and

a second member slidably disposed between said walls and having a second member bottom and a projection attached to said second member bottom for restricting the movement of a lens disposed in said assembly; said members being adapted to release said lens when said members are separated.

4,619,257

APPARATUS AND METHOD FOR CRYOPREPARING CORNEAL TISSUE FOR SURGICAL PROCEDURES

John G. Linner, and John D. Goosey, both of Houston, Tex., assignors to Board of Regents, The University of Texas System, Austin, Tex.

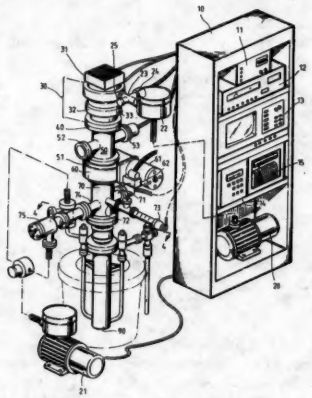
Filed Nov. 30, 1984, Ser. No. 676,856
Int. Cl.[4] A61B *17/36*
U.S. Cl. 128—303.1 **14 Claims**

1. A method for cryopreparing corneal tissue for use in surgical procedures comprising:

(a) obtaining a corneal tissue sample and sizing said tissue sample for its intended end use;

(b) vitrifying said corneal tissue sample;

(c) bringing said vitrified corneal tissue sample to equilibrium at a temperature of less than −140° C.; and



(d) dehydrating said vitrified corneal tissue sample while said sample is maintained in a state of equilibrium.

4,619,258

ELECTROSURGICAL PENCIL PROVIDING BLADE ISOLATION

L. Franklin Pool, Vancouver, Wash., assignor to Dart Industries Inc., Northbrook, Ill.

Filed Mar. 2, 1984, Ser. No. 585,565
Int. Cl.⁴ A61B *17/39*
U.S. Cl. 128—303.14 **7 Claims**

1. In an electrosurgical pencil of the type having a pencil housing, a blade at an end of the housing which receives current through a hot lead from an electrosurgical current generator upon electrical interconnection of a switching lead extending between the generator and the pencil with the hot lead, the improvement comprising: said pencil including

(a) first switch means for making and breaking contact between said switching lead and said hot lead;

(b) second switch for making and breaking contact between said hot lead and said blade; and

(c) means for preventing contact in said first switch means unless there is also contact in said second switch means.

4,619,259

OPHTHALMIC SURGERY TOOL

Walter R. Graybill, 4585 Auhay Dr., Santa Barbara, Calif. 93111, and Jeffery J. Graybill, 441 E. Camino Collegio, Santa Maria, Calif. 93454

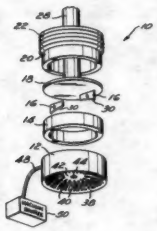
Filed May 9, 1980, Ser. No. 148,258
Int. Cl.⁴ A61B *17/32*
U.S. Cl. 128—305 **1 Claim**

1. An ophthalmic surgery tool for producing a series of cuts within the cornea of an eye for the purpose of improving vision, said surgery tool comprising:

a locating base, the exterior surface of said locating base being recessed to closely conform to the exterior surface of the eye, said locating base having an internal chamber, said locating base having a longitudinal center axis, said locating base having a plurality of spaced apart first openings formed within said exterior surface;

a cutter assembly, said cutter assembly located within said internal chamber and mounted in conjunction with said first openings, said cutter assembly being symmetrically arranged about said longitudinal center axis, said cutter assembly being movable in respect to said locating base between a retracted (non-cutting) position and an extended position, said retracted position locating said cutter assembly substantially entirely within said internal chamber, said extended position connecting said cutter assembly with said first openings with a portion of said cutter assembly conducted through said first openings protruding exteriorly of said locating base;

means connected to said cutter assembly for moving said



cutter assembly between said retracted position and said extended position;

vacuum means connected to locating base, said vacuum means for applying a vacuum within said internal chamber;

biasing means located between said locating base and said cutter assembly, said biasing means exerting a continuing bias against said cutter assembly tending to locate such in said retracted position, said biasing means comprising a ring of resilient material; and

second openings formed within said locating base, there being a said second opening located between each directly adjacent pair of said first openings, said vacuum to cause a slight suction force to be created between said locating base and the eye thereby holding the eye tightly against said locating base directly in the proximity of said cutter assembly.

4,619,260

TISSUE-RETRIEVING MEANS FOR A SURGICAL SNARE INSTRUMENT

John W. Magill, 664 N. Michigan Ave., Chicago, Ill. 60611, and Carl F. Wurster, 3413 Sunset Ave., Boise, Id. 83703

Filed Nov. 5, 1984, Ser. No. 668,098
Int. Cl.⁴ A61B *1/72*
U.S. Cl. 128—309 **15 Claims**

1. Tissue-retrieving means for a surgical open-snare instrument having a snare loop projecting longitudinally outwardly from a distal end thereof for encircling projecting body tissue, and means for contracting the loop, thereby to sever the encircled tissue from the remainder of the body, said retrieving means comprising:

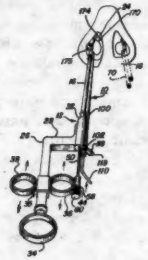
tissue-engaging means,

manipulating means connected to said engaging means,

means for mounting said manipulating means on said instrument for manipulation of said engaging means to engage tissue encircled by said loop, for removal of the tissue on the engaging means following severance of the tissue, and

means for manually effecting rotational adjustment of the position of said engaging means relative to said loop about

an axis extending longitudinally of the open-snare instrument for engagement of said engaging means with a selected portion of encircled tissue extending from either side of said loop.

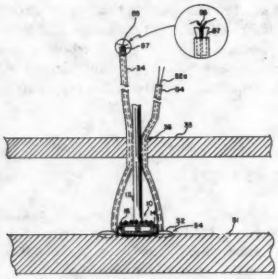


4,619,261

HYDROSTATIC PRESSURE DEVICE FOR BLEEDING CONTROL THROUGH AN INFLATABLE, STITCHABLE AND RETRIEVABLE BALLOON-NET SYSTEM

Frederico Guerriero, 1212 N. Lake Shore Dr., Chicago, Ill. 60610

Filed Aug. 9, 1984, Ser. No. 639,381
Int. Cl.[4] A61B *17/12*
U.S. Cl. 128—325 **10 Claims**



1. A device for applying hydrostatic pressure to an internal wound comprising:

an expansible balloon constructed and arranged to hold fluid;

means to restrain the movement of said expansible balloon; and

means to conduct fluid to said expansible balloon;

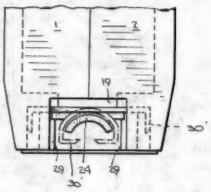
whereby when said expansible balloon is restrained from movement with respect to the wound, fluid may be conducted into said expansible balloon so as to expand said expansible balloon within said means to restrain the movement of said expansible balloon thus applying pressure to the internal wound.

4,619,262

SURGICAL STAPLING DEVICE

James Taylor, Droitwich, England, assignor to Syncare, Inc., Branchburg, N.J.

Filed Jun. 5, 1985, Ser. No. 741,483
Claims priority, application United Kingdom, Jul. 10, 1984, 8417562
Int. Cl.[4] A61B *17/04*; B31B *1/00*
U.S. Cl. 128—334 R **9 Claims**



1. A surgical stapling device for forming and implanting a staple formed of a deformable wire and having a pair of parallel limbs bridged by a straight crosspiece into the skin of a patient undergoing a surgical procedure, the device comprising:

A. a housing having an outlet;

B. a rail disposed in the housing having a row of staples straddled thereon and a metal mandrel projecting from the front end of the rail into the outlet;

C. pusher means on said rail to advance said row toward said mandrel to cause the foremost staple to be deposited on the mandrel, the mandrel being a solid plate and having an arched shape and being flanked on opposite sides by a pair of abutments on the front end of the rail;

D. a plate-like former disposed in the housing, the leading edge of the former having a recess therein leading to a complementary arched section which conforms to the arched shape of the mandrel, said former being normally retracted from the mandrel to assume an inoperative position; and

E. actuating means operatively coupled to the former to advance the former from its inoperative position to slide along the abutments at the front end of the rail to an operative position, in the course of which the mandrel is received within the recess in the former and the limbs of the staple engaged by the leading edge of the former are extended from the outlet to a degree sufficient to penetrate the skin of a patient on opposite sides of an incision to be closed, the deformable limbs being caused to bend inwardly by the coacting former and mandrel toward each other to close the incision, and the deformable crosspiece being bent to create an arched air gap above the skin to accommodate post-operative swelling.

4,619,263

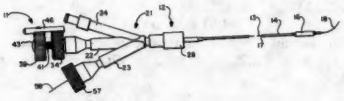
ADJUSTABLE ROTATION LIMITER DEVICE FOR STEERABLE DILATATION CATHETERS

Jeffrey S. Frisbie, San Jose, and Wilfred J. Samson, Saratoga, both of Calif., assignors to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Continuation-in-part of Ser. No. 615,139, May 30, 1984, abandoned. This application May 10, 1985, Ser. No. 732,641
Int. Cl.[4] A61M *29/02*
U.S. Cl. 128—344 **12 Claims**

1. An adjustable rotation limiter device for use with a steerable balloon type dilatation catheter of the type having a flexible core wire extending therethrough, an adapter adapted to be secured to the proximal extremity of a dilatation catheter, the adapter having at least a first arm, a fitting on the first arm, sealing means disposed within the fitting, a thumb screw having a first knob carrying a threaded axially extending member threaded into the fitting and being adapted to engage the seal-

ing means to establish a sealing engagement between the sealing means and the core wire, a torque knob having a second knob carrying an axially extending member threaded into said



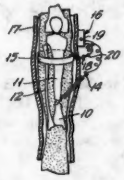
thumb screw and limit means carried by one of said knobs and having a portion thereof extending over the other of said first and second knobs and serving to limit the rotational movement of the second knob with respect to the first knob.

4,619,264

METHOD AND APPARATUS FOR TREATMENT OF FRESH FRACTURES, DELAYED UNIONS AND NON-UNIONS OF LIVING BONE

Om P. Singh, 62, Chhitwapur Road, Lucknow-226001, U.P., India

Filed Jun. 14, 1984, Ser. No. 620,748
Int. Cl.[4] A61N *1/32*
U.S. Cl. 128—419 F **25 Claims**



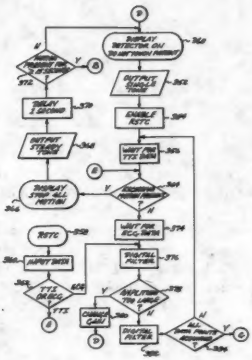
1. The method of treating freshly fractured bone in a living body which comprises selecting an electrically conductive pin element and inserting the same through flesh and marrow in the vicinity of the fracture to the extent of lodging the inserted end in internal contact with cortex tissue at one longitudinal side of the site of the fracture, applying an electrically conductive element in conductive contact with flesh in the vicinity of the fracture on the other longitudinal side of the site of the fracture, applying a single longitudinal cast over both sides of the fracture and over the sites of both of said elements with separate electrical connections external to the cast, passing direct durrent through the body via said connections, the polarity of current connection being exclusively such as to establish negative potential at said pin element with respect to positive potential at the other of said elements, the direct current comprising a steady component and a varying component, said varying component being a succession of direct-current pulses of said polarity superposed on said steady component, and maintaining the average amplitude of current via said connections at about 20 microamperes for a period of at least three weeks before removal of the cast and of said elements.

4,619,265

INTERACTIVE PORTABLE DEFIBRILLATOR INCLUDING ECG DETECTION CIRCUIT

Carlton B. Morgan; Daniel Yerkovich, both of Seattle; Thomas D. Lyster, Redmond; Eric C. Hagen, Kirkland, and Douglas H. Roberts, Lynnwood, all of Wash., assignors to Physio-Control Corporation, Redmond, Wash.

Division of Ser. No. 587,439, Mar. 8, 1984. This application Sep. 16, 1985, Ser. No. 776,391
Int. Cl.[4] A61N *1/36*; A61B *5/05*
U.S. Cl. 128—419 D **10 Claims**



4. A defibrillator comprising:

sensor means including electrodes attachable to a patient, ECG detection means connectable to the electrodes for producing an electrocardiogram signal, and motion detection means connectable to the electrodes, the motion detection means comprising means for sensing the impedance between the electrodes and for producing a motion signal indicative of the degree of variation of said impedance over time, including variation not synchronized with the electrocardiogram signal;

control means for producing a control signal, the control means comprising means for analyzing the motion signal to detect excessive patient motion, and means for preventing the production of the control signal when excessive patient motion is detected; and,

output means responsive to the presence of the control signal for applying a defibrillation pulse to a patient.

4,619,266

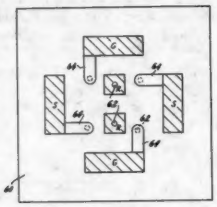
ELECTRODE ARRAY FOR MUSCLE STIMULATION AND RECORDING

John A. Hodgson, 42 Shirley Avenue, Shirley, Southampton, England

Filed May 9, 1984, Ser. No. 608,446
Claims priority, application United Kingdom, May 11, 1983, 8313005; Nov. 22, 1983, 8331149
Int. Cl.[4] A61B *5/04*; A61N *1/04*
U.S. Cl. 128—639 **10 Claims**

1. Apparatus for stimulating and recording electrical activity in a muscle in a mammalian body, said apparatus comprising an electrode array connected to a signal processing apparatus, said electrode array comprising a pair of recording electrodes and a pair of stimulating electrodes, means for mounting said electrodes in fixed, spaced relationship, both pairs of electrodes being adapted for placement on the skin of a mammal overlying a muscle, in electrical contact therewith, the two electrodes of each pair being spaced from each other along respective axes of the array, and the axis of one electrode pair being generally at right angles to that of the other pair; and the signal processing apparatus comprising means for receiving a signal

from the recording electrodes, means for processing the signal to produce a control signal for controlling a bodily response;



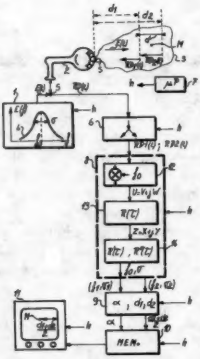
and means for feeding the control signal to the stimulating electrodes.

4,619,267

METHOD FOR CHARACTERIZING THE STRUCTURE OF A MEDIUM AND DEVICE FOR CARRYING OUT THE METHOD

Olivier Lannuzel, Meaux, and Thierry Pradal, Creteil, both of France, assignors to CGR Ultrasonic, Paris, France

Filed Dec. 14, 1984, Ser. No. 682,756
Claims priority, application France, Dec. 16, 1983, 83 20198
Int. Cl.[4] A61B *10/00*
U.S. Cl. 128—660 **16 Claims**



1. A method of characterising the structure of a medium by calculating the acoustic absorption coefficient of the medium comprising the steps of:

transmitting a pulsed acoustic signal having a frequency spectrum which is gaussion around a mean frequency towards the medium,

receiving a first acoustic signal reflected by a first zone of the said medium at a given period, and a second acoustic signal reflected by a second zone of the medium at a subsequent period,

analyzing the spectrum of the two received reflected signals to obtain the central frequency of the Fourier spectrum of each of these reflected signals,

calculating the acoustic absorption coefficient of the medium between the said two zones on the basis of the central frequencies obtained for each of these zones, and on the basis of the distance separating these zones,

wherein the said spectrum analysis comprises

performing a demodulation in phase quadrature at the mean frequency of the two reflected signals

calculating the autocorrelation functions of these demodulated signals, and

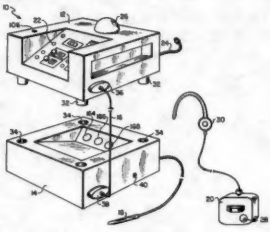
calculating the derivatives of the first order of these autocorrelation functions which represent said central frequencies.

4,619,268

ESOPHAGEAL STETHOSCOPE AND VITAL SIGNS MONITOR SYSTEM

James D. Uphold, Canoga Park, and Robert L. Pfohl, Anaheim Hills, both of Calif., assignors to Vitacomm, Ltd., Orange, Calif.

Filed Aug. 11, 1983, Ser. No. 522,640
Int. Cl.[4] A61B *5/02*
U.S. Cl. 128—671 **19 Claims**



1. An esophageal stethoscope catheter comprising:

an elongated flexible tube having a distal end and a near end and dimensioned to be disposed in a patient's esophagus;

sound detection means in the distal end of said tube;

means including connector means at said near end for connecting said sound detection means to monitoring means;

temperature sensing means in said distal end including a connector at said near end; and

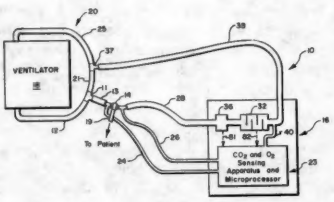
interface circuit means for receiving said connector means and said connector for connecting said sound detecting means and said temperature sensing means to said monitoring means, and including self-destruct circuit means for destruction of said sound detection means.

4,619,269

APPARATUS AND METHOD FOR MONITORING RESPIRATORY GAS

Christopher A. Cutler, Bountiful, and William D. Wallace, Salt Lake City, both of Utah, assignors to Utah Medical Products, Inc., Midvale, Utah

Continuation-in-part of Ser. No. 509,209, Jun. 29, 1983, abandoned. This application Apr. 11, 1984, Ser. No. 599,080
Int. Cl.[4] A61B *5/08*; A61M *16/00*
U.S. Cl. 128—719 **27 Claims**



1. In a system for mechanically ventilating a patient, an apparatus comprising:

means for forming a first fluid flow circuit from which said patient is ventilated by a stream of oxygen enriched gas;

means for forming a second fluid flow circuit connected to

said first circuit, said second circuit comprising means for isolating respiratory gases expired by said patient from said first circuit, said second circuit further comprising an inlet end connected at a first point in said first circuit and an outlet end connected at a second point in said first circuit, the resistance to fluid flow from said inlet end to said outlet end of said second circuit being from about 10 to about 100 times greater than the resistance to fluid flow between said first and second points in said first circuit;

a cooler capable of removing water vapor from said respiratory gases, said cooler comprising a first thermoelectric cooling block and a second insulating block mounted to said first block, a wick placed between said first and second blocks, said wick being capable of absorbing water, and a length of tubing placed between said blocks and in contact with said wick, said tubing consisting of hydrophilic material which allows for the passage of water through the walls of said tubing;

means connected to said second circuit, for detecting the concentration of one or more gases contained in a gaseous sample flowing through said second circuit; and

means for electronically processing information derived from said means for detecting the concentration of one or more said gases.

4,619,270

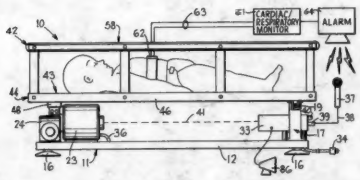
INFANT RESPIRATORY ARREST STIMULATOR DEVICE

Frederick J. Margolis, 2134 Waite Ave., and Clayton K. Cole, 1821 Hillsdale, both of Kalamazoo, Mich. 49008

Filed Apr. 16, 1984, Ser. No. 600,498

Int. Cl.[4] A61B *5/05*

U.S. Cl. 128—721 **9 Claims**



1. An infant respiratory arrest stimulator device for use with a respiratory/cardiac monitoring system, comprising:

a frame;

a crib having a generally horizontal and a movable child supporting surface and sidewalls extending upstandingly therefrom adjacent the perimeter of said movable supporting surface;

a drive motor mounted on said frame and having a movable output member;

connecting means for drivingly connecting said output member to said child supporting surface;

control means for controlling the frequency and amplitude of movement of said child supporting surface, said frequency being in the range of 100 to 260 cycles per minute and said amplitude being in the range of ½ inch to 1½ inches peak to peak; and

means for initiating a movement of said output member in response to an occurrence of an apnea and bradycardia episode to a child adapted to be located on said supporting surface for effecting a vigorous shaking of the child on said child supporting surface.

4,619,271

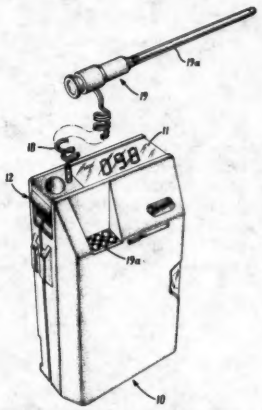
ELECTRONIC THERMOMETER WITH PROBE ISOLATION CHAMBER

Laurie J. Burger, North Branford; Joel N. Helfer, Cheshire; Donald E. Protzmann, Litchfield, and Robert F. Uhl, Cheshire, all of Conn., assignors to Chesebrough-Pond's, Inc., Greenwich, Conn.

Filed Dec. 13, 1984, Ser. No. 681,308

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—736 **6 Claims**



1. An electronic thermometer comprising a housing containing electrical circuits for the thermometer, a probe including a temperature sensitive element for insertion into a body orifice, an isolation chamber for storing the probe, an electric cable connected to the temperature sensitive element and permanently connecting the probe to the chamber, conductor means connecting the cable to a connector on the isolation chamber, a compartment in the housing adapted to slidably receive the isolation chamber, a connector in the compartment for electrically receiving the chamber connector for coupling the probe electric cable to components in the housing when the isolation chamber is positioned in the compartment, a switch including an operating member in the housing connected to electrical circuits in the housing, a switch actuating device in a wall of the compartment, said switch actuating device including an actuator movable between first and second positions, the probe when inserted and withdrawn from the compartment of the isolation chamber engaging the actuator to move it between the first and second positions for moving the operating member to operate the switch.

4,619,272

INSTRUMENT FOR CARRYING OUT BIOPSIES ON TISSUES REMOVED FROM ORGANS TO BE EXAMINED

Roberto Zambelli, Via Borsa, 69, Milan, Italy

Filed Jul. 12, 1985, Ser. No. 754,844

Claims priority, application Italy, Jul. 31, 1984, 22756/84[U]

Int. Cl.[4] A61B *10/00*

U.S. Cl. 128—753 **8 Claims**

1. An instrument for performing biopsies on tissues removed from organs to be examined, which comprises:

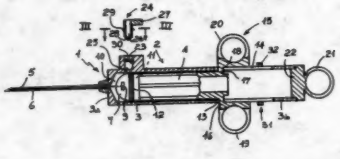
an outer cylindrical body;

a hollow, biopsy cannula affixed to one end of the cylindrical body; the means cannula having an organ penetrating tip;

a piston slidably movable within the cylindrical body, the piston and the cylindrical body defining a suction chamber, the piston including a slit formed therein, the suction chamber communicating with the interior of the biopsy cannula;

a stylet slidably movable within the cannula and operatively coupled to the piston, the stylet having a hollow needle defining an air path communicating with the suction chamber; through the slit formed in the piston

a pair of oppositely disposed longitudinal guides formed on the cylindrical body;



grip means for effecting movement of the piston relative to the body, the grip means being slidably mounted within said guides and operatively coupled to the piston so as to be movable therewith; and

stroke limiting means for limiting the movement of the grip means with respect to the body, the stroke limiting means being mounted and adjustably positioned on the cylindrical body and adapted to abut the grip means.

4,619,273

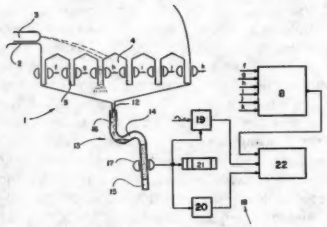
DEVICE FOR DIAGNOSING AND MONITORING UROLOGICAL DISEASES

Baumberg Iosif, 54 Bay 29 St. #B5, Brooklyn, N.Y. 11214

Filed Aug. 4, 1983, Ser. No. 520,348

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—771 **10 Claims**



1. A device for diagnosing and monitoring urological diseases, comprising means for determining variations of an exit speed of a urine stream during urination of a patient over a period of time as a function of time, said determining means including a plurality of first sensing elements arranged successively one after the other and therefore at different distances from a point of urine stream exit and having inputs formed so that a urine stream flowing out of a patient directly reaches a respective one-of-said sensing elements without passing through intermediate elements, so that when the urine stream reaches a respective one of said first sensing elements a signal is produced which corresponds to its distance from the urine exit point of a patient and is therefore an indication of the linear exit speed of the urine stream; means for producing said signal; and selecting means cooperating with said determining means so that in the event when the urine stream reaches more than one of said sensing elements the signal is produced by only such sensing element which is located further from the urine exit point.

4,619,274

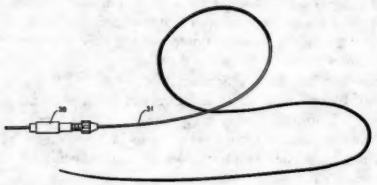
TORSIONAL GUIDE WIRE WITH ATTENUATED DIAMETER

David W. Morrison, San Jose, Calif., assignor to Advanced Cardiovascular Systems, Inc., Mountain View, Calif.

Filed Apr. 18, 1985, Ser. No. 724,624

Int. Cl.[4] A61B *5/00*

U.S. Cl. 128—772 **9 Claims**



1. In a guide wire having a progressively attenuated diameter, an elongated core element having proximal and distal ends and having a decreasing cross sectional area in a direction towards the distal end, a coil carried by, surrounding and secured to said core element, said coil having proximal and distal ends, said coil having a diameter which decreases in a direction towards the distal end, said coil being formed of a wire which has a diameter which decreases from one end to the other end and which is wound in a helix so that the larger diameter wire begins in a region closer to the proximal end and the smaller diameter wire ends in a region closer to the distal end.

4,619,275

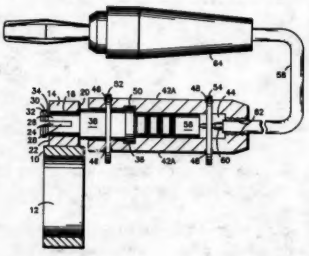
GROUNDING RING

Danny E. Ross, Plantation, and Larry O. Bond, Davie, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 5, 1985, Ser. No. 762,468

Int. Cl.[4] A61N *1/14*

U.S. Cl. 128—783 **1 Claim**



1. Apparatus for electrically contacting the human body at a finger, comprising in combination:

an electrically conductive finger ring, engagable with said finger, for electrically contacting said finger;

an electrically conductive connector ring having an aperture, said connector ring being electrically connected to said conductive finger ring and attached to the outside of said conductive finger ring;

an electrical connector plug, removably inserted into said connector ring, said connector plug having a substantially longitudinal slot and a retaining flange;

an attaching flange attached to said connector plug;

a housing having a cavity, said cavity having an internal groove, said attaching flange being inserted into said internal groove;

said housing including two complementary parts, said parts having an external groove;

a snap ring, inserted into said external groove, to join said complementary parts; and

a resistor, located in said cavity and electrically connected to said connector plug.

4,619,276

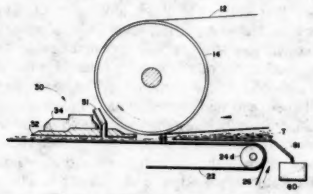
TOBACCO PROCESSING

Douglas E. Albertson, Richmond; James O. Dyson, Ashland; Eugene B. Fischer, Chester; Robert T. Gaudlitz, Richmond; Lewis A. Haws, Richmond; Gus D. Keritsis, Richmond; Louis L. Long, Richmond; Charles S. McClung, Richmond; Jose G. Nepomuceno, Richmond, and Steven R. Wagoner, Richmond, all of Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 3, 1984, Ser. No. 637,259

Int. Cl.[4] A24B *15/28;* **A24C** *15/18;* **A24D** *1/00, 1/18*

U.S. Cl. 131—79 **27 Claims**



13. In the manufacture of cigarettes, the method which comprises:

providing a moving stream of tobacco;

producing a liquid additive foam;

applying the liquid additive foam to said moving stream of tobacco.

4,619,277

TOBACCO FILTER TIP ATTACHING APPARATUS

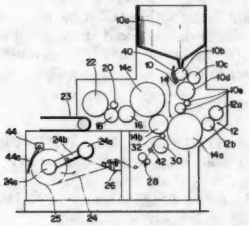
Yutaka Okumoto, Musashino; Toshiyuki Ozaki, Tokyo, and Mikio Komori, Matsudo, all of Japan, assignors to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan

Filed Dec. 27, 1984, Ser. No. 686,867

Claims priority, application Japan, Dec. 27, 1983, 58-244868

Int. Cl.[4] A24C *5/52*

U.S. Cl. 131—94 **1 Claim**



1. A tobacco filter tip attaching apparatus including:

(a) a filter tip attaching portion having means for rolling and pasting a tip paper onto both one end portion of a cigarette and a filter tip disposed adjacent said one end portion;

(b) a filter tip feed portion disposed in the vicinity of said filter tip attaching portion having means for feeding filter tips to said filter tip attaching portion;

(c) a tip paper feed portion disposed in the vicinity of said filter tip attaching portion having means for feeding a tip paper from a tip paper roll to the filter tip attaching portion;

(d) a filter tip sensor means for detecting that the feed of filter tip from said filter tip feed portion to said filter tip attaching portion is discontinued;

(e) a tip paper cutting sensor means for detecting a cutting accident of the tip paper during feed from said tip paper portion to said filter tip attaching portion;

(f) a roll diameter sensor means for detecting that the diameter of the tip paper roll in said tip paper feed portion has become smaller than a predetermined value;

(g) the whole of the apparatus being covered with a cover, said cover being provided with openable doors in positions corresponding respectively to said filter tip feed portion, filter tip attaching portion and tip paper feed portion; and

(h) power sources source means provided in corresponding relation to said doors are operated selectively in accordance with output signals provided from said sensor means to open one or more of said plural doors automatically.

4,619,278

SMOKING ROD WRAPPER

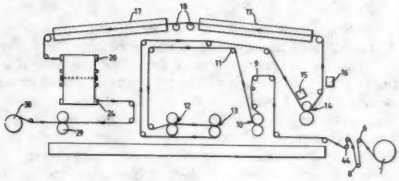
Clement G. Smeed, Eire, and Shane C. Browning, Newtownabbey, both of Ireland, assignors to Gallaher Limited, Great Britain

Filed Jan. 30, 1984, Ser. No. 575,265

Claims priority, application United Kingdom, Jan. 31, 1983, 8302594

Int. Cl.[4] A24B *15/28;* **A24C** *5/60*

U.S. Cl. 131—284 **21 Claims**



1. A method of processing a web of smoking rod wrapper suitable for filter tip cigarettes, said web having opposed first and second surfaces, wherein said web is passed through initial and final printing stations in series, and then reeled up for subsequent use on a continuous smoking rod-making machine; said web being printed at said initial printing station on said first surface with a regularly longitudinally spaced registration marking, and being printed at said final printing station and on said second surface with a repetitive regularly spaced pattern of a deposit containing at least one additive selected from a group comprising a burn control agent, a smoke producing agent, a smoke nucleation agent, a flavoring agent, and a physiologically active agent, said pattern being repeated on successive sectional web lengths comprising one or more smoking rod lengths of web, said registration markings being printed at least one end of said sectional lengths and having a dimension in the longitudinal direction of said web such that at least after cutting said web into individual smoking rod lengths, said marking dimension is small enough to be covered by the overlap of a conventionally applied tipping wrapper.

4,619,279

TOBACCO SMOKE FILTER

Makoto Shiga; Akira Miyazawa, and Mitsuyosi Miyutani, all of Osaka, Japan, assignors to Daicel Chemical Industries Ltd., Osaka, Japan

Filed Feb. 1, 1983, Ser. No. 524,141
Int. Cl.[4] A24D *3/04*
U.S. Cl. 131—345 **4 Claims**

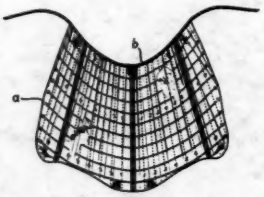
1. A tobacco smoke filter comprising cellulose acetate filaments having a C-shaped cross section.

4,619,280

CUT AND STYLE—DEVICE FOR FASHION HAIRCUTTING-HAIRSHAPING AND HAIRSTYLING

Ludmila Yampolskaya, 1-Bogardus Pl., Ap 5M, New York, N.Y. 10040

Filed Mar. 14, 1983, Ser. No. 474,975
Int. Cl.[4] A45D *24/36*
U.S. Cl. 132—45 R **2 Claims**



1. A device for use in fashion haircutting and hairshaping to enable a hairdresser or hairdesigner to precisely and effectively create, recreate or record a predetermined haircut of any desired hair lengths at each and every point of a head or wig, said device being adapted to be selectively disposed at a plurality of positions on the head of the person whose hair or wig is to be cut and shaped, and comprises,

(a) a principal part consisting of a sheet of substantially flat, smooth, thin, limply flexible, transparent and water-impervious material having a concavely arcuate upper edge adapted to be placed and fit in completely surrounding and continuously closely fitting engagement with the front, back and sides of a user's head at any of a plurality of circumferential positions located at various preselected parting lines on any level on the head, a lower edge spaced from said upper edge by dimensions varying along its length selected to conform generally to the hair lengths and shoulders and a pair of opposed side edges connecting said upper and lower edges, said sheet being shaped and dimensioned to assume a generally truncated-conical configuration, depending from said upper edge in surrounding relation to the front, sides and back of the user's head for a distance sufficient to underlie a substantial range of side and back hair lengths when said upper edge is positioned on the head as aforesaid,

said sheet having thereon a first set of indicia consisting of a plurality of straight lines for guiding the symmetry of a haircut while the layers of strands of hair on any preselected parting line, on any level of the user's head, are being cut and shaped, said straight lines extending generally radially from said upper edge toward said lower edge and being distributed over the entire area of the sheet relative to a common center and having a predetermined angular spacing between them, and

a second set of indicia consisting of a plurality of curved arcuate generally parallel lines for guiding the cutting and shaping of layers of strands of hair on a head to any predetermined length, said plurality of curved arcuate lines conforming in curvature generally to the curvature of said upper edge and extending transversely to said straight lines entirely across the sheet, said arcuate curved lines being distributed over the entire area of the sheet with substantially equidistant spacing of predetermined extent between them and each intersecting said straight lines such that each arcuate line has a multiplicity of angularly spaced intersections with the straight lines,

a first set of identifying designations consisting of designations respectively associated with said straight radial lines, and

a second set of designations consisting of designations respectively associated with said curved arcuate lines, whereby each of said lines is identified to enable the hairdresser/hairdesigner to obtain any preselected hair length at each and every parting level at which the device is placed with said straight lines serving to guide the symmetry of the haircut relative to their center while the layers of strands of hair on any level of the head are being cut and shaped, and said curved arcuate lines serving to allow the hairdresser/hairdesigner to cut and shape said layers of strands of hair on the head to any predetermined length

(b) means permanently attached to and along the whole length of said upper edge of said sheet for selectively and adjustably securing said upper edge at any selected one of a plurality of parting lines on the head of a user whose hair is to be cut and shaped at a plurality of different levels on said head, with said upper edge of said sheet being engaged in an arcuate curved configuration around the head, and with the sheet curving around the head below said upper edge and below said one parting line on the head at which it is secured, and hanging downwardly therefrom in a generally truncated-conical configuration as aforesaid to cover the hair below said one parting line, while leaving the user's face exposed, whereby said sheet in said truncated-conical configuration separates the hair above and below said one parting line, at which it is secured, while said straight and arcuate curved lines serve to guide the cutting and shaping of the layer of strands of hair above said parting line, when said layer of strands is draped over the surface of said sheet to permit measuring of the strands to be cut and shaped and, as they are being cut and shaped, to insure symmetry, accuracy and precision of the cutting and shaping operation, while the hair beneath said sheet, within said truncated-conical configuration, is visible through said sheet for comparison with the layer of strands being cut and shaped when it is draped on and over said lines on said sheet.

4,619,281

UMBRELLA WITH IMPROVED WIND-UP HANDLE

Richard S. Redl, and Robert F. Redl, both of 15 E. Summit Ave., Midland Park, N.J. 07432

Filed Jun. 5, 1985, Ser. No. 741,544
Int. Cl.[4] A45B *17/00*
U.S. Cl. 135—20 M **16 Claims**

1. An umbrella comprising:

a collapsible cover;

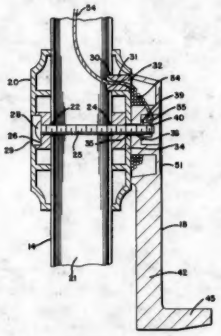
means for operatively moving said cover between open and closed positions;

a hollow pole supporting said cover;

a flexible cable extending within said hollow pole, one end of said cable being connected to said means for moving;

handle means mounted on the exterior of said pole and including a rotatable handle and a wind-up spool adapted to rotate when the handle rotates; and

said pole having a side opening through which said cable extends, the other end of said cable being connected to



said spool whereby rotation of said handle causes said cable to wind around said spool for opening said cover.

4,619,282

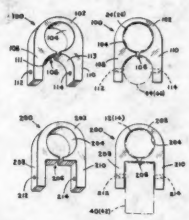
CLAMPS FOR INVALID WALKER TO ENHANCE STRUCTURAL INTEGRITY

Joseph Battiston, Clifton, N.J., assignor to Tubular Fabricators Industry, Inc., Passaic, N.J.

Filed Oct. 16, 1984, Ser. No. 661,260

Int. Cl.[4] A61H *3/00*; F16L *41/08*

U.S. Cl. 135—67 **16 Claims**



9. A device for supporting invalids, comprising:

four vertically disposed support legs, each support leg including a pair of inner and outer telescoping leg portions;

at least one cross member, each interconnecting at least two vertically disposed support legs;

a plurality of A-shaped clamps, each connecting an outer telescoping leg portion of each support leg to said at least one cross member, each A-shaped clamp including

a substantially U-shaped portion;

first and second spaced-apart legs having first ends extending from said U-shaped portion at first and second junctions, said first and second legs including opposing apertures for receiving a tightening member;

a cross bar having opposite ends extending from said clamp at positions adjacent said junctions, said cross bar disposed substantially transverse to said first and second legs, said cross bar having a section thereof cut-away to define a gap therein, said cross bar having a substantially uniform depth throughout its length;

a first bar receiving section defined between said U-shaped portion and said cross bar, for receiving an outer telescoping leg portion, such that said cross bar wraps about said respective outer telescoping leg portion when said clamp is tightened by said tightening member; and

a second bar receiving section defined between said first and second legs and said cross bar for receiving a cross member, with said cross bar preventing substantial contact and substantial deformation of either of said respective cross member and outer telescoping leg portion by the other of said respective cross member and outer telescoping leg portion.

4,619,283

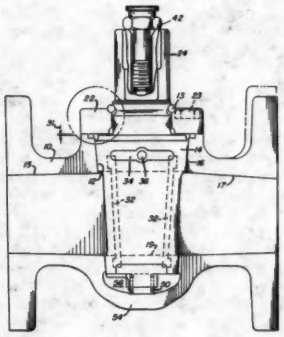
STEM SEAL FOR TAPERED LUBRICATED PLUG VALVES

E. Frederick Schoeneweis, Coraopolis, and Donn W. Duffey, Pittsburgh, both of, assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Jan. 27, 1986, Ser. No. 822,441

Int. Cl.[4] F16K *41/00, 43/00*

U.S. Cl. 137—15 **4 Claims**



1. Method of providing a stem seal for a tapered plug valve having a body enclosing a chamber bounded by a tapered bore, a tapered plug adapted to be received on said bore and having a stem integrally formed on and extending from the large end of said plug, a wall on said body closing the large end of said chamber and having an opening through which said stem projects, a sealant system comprised of grooves in said plug and said bore for conducting sealant to said plug and said bore, said method comprised of the steps of:

(a) inserting said plug into said bore with sufficient force to insure metal-to-metal contact between said plug and said bore,

(b) providing a clearance between the large end of said plug and said wall when said plug is in metal-to-metal contact with said bore,

(c) providing an annular space between said wall, said stem and the portion of the large end of said plug adjacent said stem which space communicates with said clearance,

(d) providing a seal ring in said annular space of deformable material which substantially fills said annular space and extends below said wall and into contact with the large end of said plug when said plug and said bore are in metal-to-metal contact and

(e) injecting sealant fluid under pressure into said system to force said plug to move away from said bore and deform a portion of said ring into the clearance between said wall and the large end of said plug.

4,619,284

PYROTECHNIC VALVE

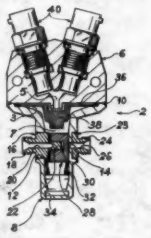
Jean-Jacques Delarue, Vélizy, and Claude Ego, Verneuil sur Seine, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Verneuil sur Seine, France

Filed Mar. 18, 1985, Ser. No. 712,645

Claims priority, application France, Mar. 21, 1984, 84 04391

Int. Cl.[4] F16K *17/14*

U.S. Cl. 137—67 **7 Claims**



1. A pyrotechnic valve comprising:

a valve body having an inner cavity;

a deformable disk-shaped membrane;

a rigid weight mounted on said deformable membrane, said rigid weight and said deformable membrane together tightly subdividing said inner cavity into a first part and a second part;

a fluid inlet and a fluid outlet communicating with said second part of said inner cavity;

a valve member disposed in said second part of said inner cavity for interrupting passage of fluid therethrough;

a pyrotechnic device for producing gases in said first part of said inner cavity, said weight being displaceable under the action of the gases produced by said pyrotechnic device so as to move said valve member;

said membrane being plastically deformable under the action of the gases produced by said pyrotechnic device and said inner cavity being provided with a seat to which the entire membrane is applied once it has been deformed.

4,619,285

FLUID FLOW CONTROL DEVICE

Meyer Piet, Arcadia, Calif., assignor to Futurecraft Corporation, Industry, Calif.

Filed Jun. 10, 1983, Ser. No. 503,096

Int. Cl.[4] F16K *13/04*

U.S. Cl. 137—68.2 **4 Claims**

1. A fluid flow control device adapted to be interconnected between a container containing a gas at high pressure and an inflatable device for controlling the flow of gas therebetween, said control device comprising:

(a) a body including a first chamber having a fluid inlet and a fluid outlet and a pair of explosive gas flow passageways, each having first and second ends;

(b) connector means adapted to interconnect said body with the container, said means including a fluid inlet passageway adapted to communicate with said first chamber and with the fluid outlet of said container;

(c) a support spool disposed within said first chamber intermediate said fluid inlet and said fluid outlet said spool being reciprocally movable within said first chamber from a first position to a second position;

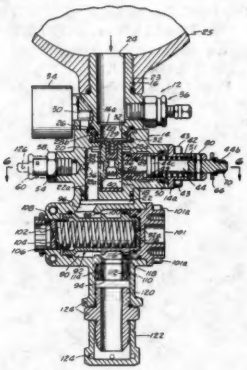
(d) a shearable diaphragm removably located between said connector means and said body for normally preventing fluid flow between said container and said fluid inlet of said first chamber, said spool being adapted to reinforce said diaphragm against pressurized fluid in said container when said spool is in said first position;

(e) a second chamber formed within said body proximate said first chamber and extending generally perpendicular with respect thereto, said second chamber being in communication with said first ends of said explosive gas flow passageways of said body;

(f) a piston reciprocally movable within said second chamber from a first position to a second position, said piston having first and second ends and including a locking boss protruding from said first end adapted to engage a shoulder formed on said support spool when said piston is in its first position whereby said spool is maintained in said first position in supportive engagement with said diaphragm, said piston also having an enlarged diameter central portion defining first and second spaced apart radially outwardly extending shoulders;

(g) actuation means carried by said body for moving said piston from said first position to said second position whereby said locking boss will move out of engagement with said shoulder and pressurized fluid within said inlet will act to shear said diaphragm to permit fluid to flow out said fluid outlet, said actuation means comprising:

(1) pyrotechnic means carried by said body proximate said second chamber for interaction with said piston to urge movement thereof toward said second position, said pyrotechnic means being in communication with said second ends of said explosive gas passageways formed in said body; and



(2) mechanical means carried by said body for moving said piston from said first position to a second position;

(h) a third chamber formed within said body having a fluid outlet and a fluid inlet in communication with said fluid outlet of said first chamber;

(i) a circumferentially inwardly extending shoulder formed within said third chamber intermediate said fluid inlet and said fluid outlet;

(j) a valve member reciprocally movable within said third chamber from a first position to a second position in response to fluid pressure exerted thereon, said member including a circumferentially outwardly extending protuberance for engagement with said shoulder when said valve member is moved to said second position to prevent fluid flow between said inlet and outlet of said third chamber;

(k) first biasing means operably associated with said valve member for yieldably resisting movement thereof from said first position to said second position;

(l) second biasing means for yieldably resisting movement of said piston from said first position to said second position; and

(m) fluid diverting means disposed within said outlet of said third chamber for diverting a portion of the fluid flowing

therethrough and directing it toward said valve member to urge movement thereof toward said second position;

whereby when said pyrotechnic means is ignited, explosive gases will flow through said pair of explosive gas flow passageways and said explosive gas will impinge upon said first shoulder of said piston urging said piston toward said second position against the urging of said second biasing means.

4,619,286

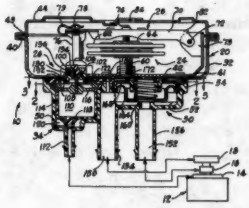
ELEVATION RESPONSIVE AUTOMATIC VEHICLE CONTROL SYSTEM

Roland B. Caldwell, Worthington, Ohio, assignor to Ranco Incorporated, Dublin, Ohio

Filed May 14, 1984, Ser. No. 609,808

Int. Cl.⁴ F02M *7/24*

U.S. Cl. 137—81.1 **9 Claims**



1. An altitude compensating fuel mixture controller for a carbureted automotive vehicle engine comprising:

(a) a supporting housing;

(b) an aneroid bellows connected to said housing;

(c) a control valve assembly having a pressure input port connected to a pressure source related to an intake manifold pressure, a vent port connected to atmosphere, a pressure output chamber, and valving structure movable from a predetermined position to alter communication between said output chamber and one of said input and vent ports to change an output pressure in said output chamber, said valving structure defining a differential pressure responsive means having a region exposed to atmospheric pressure and another region exposed to the output pressure such that said differential pressure responsive means is acted upon by differential pressure forces whose magnitudes vary depending on the difference between ambient atmospheric pressure and the output pressure;

(d) a force transmitting member supported by said body for transmitting force between said aneroid bellows and said valving structure, and;

(e) a pressure actuated fuel mixture controlling valve communicating with said output port and supported by said body;

(f) said force transmitting member effective to transmit incremental motion of said bellows to said-valving structure in response to sensed atmospheric pressure reduction below a predetermined level indicative of a vehicle altitude above a predetermined altitude such that a biasing force is applied to said differential pressure responsive means;

(g) said output pressure changing to produce a feedback pressure force acting on said differential pressure responsive means to oppose said incremental bellows motion and to return said valving structure to said predetermined position, said feedback pressure force reacting against said bellows force via the force transmitting member to limit the degree of extension and retraction of said bellows to incremental amounts from a predetermined degree of extension.

4,619,287

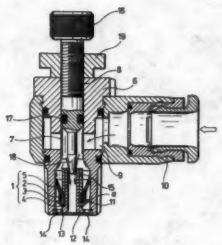
VALVES PROPER FOR VALVE-TYPE FLUID-FLOW CONTROLLERS

Tomio Hama, and Kiyoyasu Yamazaki, both of Okaya, Japan, assignors to Nihon Pisuko Kabushiki Kaisha, Nagano, Japan

Continuation of Ser. No. 433,149, Oct. 6, 1982, abandoned. This application Mar. 15, 1985, Ser. No. 712,204

Int. Cl.⁴ F16K *15/14*

U.S. Cl. 137—513.3 **3 Claims**



1. A valve for valve-type fluid flow controllers for providing a fluid flow path to permit the flow of fluid in a first direction and for providing a controlled flow in the reverse direction comprising:

a flow bore;

a substantially conical diaphragm constructed of an elastic material and having a predetermined height, said substantially conical diaphragm being operatively positioned with said flow bore;

said diaphragm including a minimum diameter portion having an aperture formed therein;

a cap member for mounting on said minimum diameter portion of said diaphragm;

a plurality of stripes extending from said cap member and engaging an outer surface of said diaphragm, said stripes extending along said diaphragm for a predetermined distance which is less than the predetermined height of said diaphragm;

said cap member including an aperture formed therein for aligning with said aperture in said diaphragm;

a collar support traversing said flow bore and having apertures therein;

a sleeve support affixed to said collar support and extending axially within said flow bore, said sleeve support including an aperture formed therein for aligning with said apertures in said diaphragm and cap member;

a fixing ring for retaining said diaphragm and cap member on said sleeve support in an operative position wherein said diaphragm is seated within said flow bore;

a tapered needle movably mounted for insertion into said aligned apertures in said sleeve support, said diaphragm and said cap for controlling the flow of fluid therethrough;

wherein fluid flowing in a first direction biases said diaphragm in a first direction to permit free flow of fluid through said flow bore and fluid flowing in a reverse direction biases said diaphragm in a reverse direction to permit controlled flow of fluid past said tapered needle.

4,619,288

ADJUSTABLE TRANSDUCER AND LOCK MECHANISM FOR MONITORING VALVE POSITION

Robert R. McPherson, Kalamazoo, Mich., assignor to Pneumo Corporation, Boston, Mass.

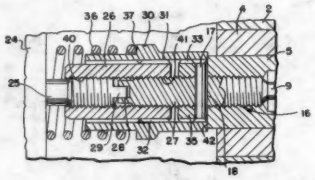
Filed Nov. 6, 1985, Ser. No. 795,337

Int. Cl.⁴ F16K *37/00*

U.S. Cl. 137—554 **19 Claims**

1. In combination, a fluid valve and transducer mechanism

for monitoring valve position, said valve including an axially movable valve plunger, and said transducer mechanism including an armature core connected to said valve plunger for movement therewith, adjusting means for adjusting the axial position of said armature core relative to said valve plunger, and locking means for releasably locking said armature core against relative axial movement, said adjusting means including means providing a lost-motion connection between said



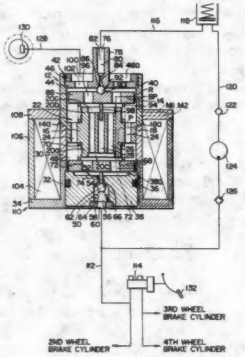
armature core and valve plunger permitting relative axial movement but preventing relative rotation therebetween, and sleeve means having different thread means in threaded engagement with threaded portions of said armature core and valve plunger, respectively, which, upon rotation of said sleeve means in opposite directions, will cause axial movement of said armature core toward and away from said valve plunger, and releasable lock means for preventing rotation of said sleeve means.

4,619,289

SOLENOID-CONTROLLED VALVE

Naohiko Tsuru, Okazaki, and Yoshihisa Nomura, Toyota, both of Japan, assignors to Nippondenso Co., LTD., Kariya and Toyota Jidosha Kabushiki Kaisha, Toyota, both of, Japan

Filed Dec. 28, 1984, Ser. No. 687,740
Claims priority, application Japan, Dec. 28, 1983, 58-249785
Int. Cl.[4] F16K *31/02*
U.S. Cl. 137—627.5 **6 Claims**



1. A solenoid-controlled valve comprising:

a housing having an interior control chamber and including a tubular part closed at its opposite ends by first and second end parts of non-magnetic material, said tubular part having first and second end portions of magnetic material separated by an intermediate portion of non-magnetic material;

means defining first and second ports in said first and second end parts, respectively, communicating with said chamber, said first port having an outwardly facing first valve seat and said second port having an inwardly facing second valve seat;

a first valve member cooperating with said first seat to close said first port;

seating spring means urging said first valve member to seat to close said first port;

a second valve member cooperating with said second valve seat to close said second port;

means defining a third port in said second end part communicating with said chamber;

first and second members in said chamber, made of magnetic material and located adjacent and movable toward and away from said first and second ports, respectively, said first member being provided with means to engage and unseat said first valve member and said second movable member being engageable with to seat said second valve member;

fixed ported partition means of magnetic material in said chamber between said movable members and peripherally engaged with said second end portion;

spring means engaged between said partition means and each of said movable members for urging the latter toward their respective end parts to thus unseat said first valve member against the urging of said seating spring means and open said first port and engage said second valve member and close said second port;

a solenoid surrounding said tubular part and extending beyond the opposite ends of said intermediate portion for applying a magnetic field to the interior of said housing;

a yoke member which, together with said tubular part, encloses said solenoid, said yoke member, said first end portion, said first movable member, said partition means, said second movable member and said second end portion defining a magnetic circuit having a magnetic flux;

a magnetic flux by-pass for flowing magnetic flux between said second end portion and said partition means to by-pass said second movable member in said magnetic circuit, said flux by-pass being saturated with a magnetic flux smaller than that in said magnetic circuit; and

means defining magnetic resistances between said second movable member and said second end portion and between said first movable member and said first and end portion, the resistance between said second movable member and said second end portion being greater than that between said first movable member and said first end portion,

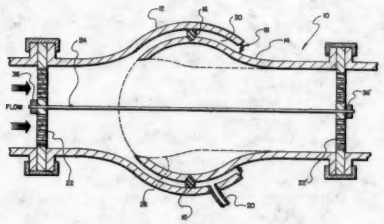
whereby application of a small electric current to said solenoid magnetically attracts said first movable member toward said partition means with sufficient force to overcome that of said spring means therebetween and allows said first valve member to seat while said flux by-pass lessens the magnetic attraction of said second movable member toward said partition means sufficiently to avoid overcoming the force of said spring means therebetween and thus said second port remains closed, and

application of a large electric current to said solenoid causes said by-pass to become saturated with magnetic flux and flux flows through said magnetic resistance between said second movable member and said second end portion and develops sufficient magnetic attraction between said second movable member and said partition means to overcome the force of said spring means therebetween and thus unseats said second valve member and opens said second port.

4,619,290
TORQUELESS FLUID CONNECTOR

Ellis Katz, Encino, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Jan. 7, 1985, Ser. No. 689,409
Int. Cl.[4] F16L *55/00*
U.S. Cl. 138—39 9 Claims

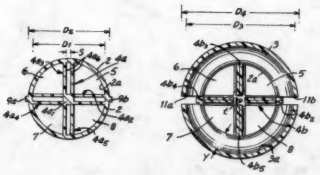


1. A connector for a fluid-flow line, designed to minimize the torque effects of fluid-flow on the connector, comprising:
an outer ball member comprising a truncated sphere with a tubular shape at the non-truncated end;
an inner ball member shaped like the outer ball member and nesting within it, the truncated end of the outer ball member facing towards the downstream side of the flow and the truncated end of the inner ball member facing upstream;
a seal groove having an upstream wall included in an outer surface of said inner ball member and extending around the outer surface of said inner ball member;
a pair of functioning end members comprising circular discs in the form of a grid structure, each end member being attached to the tubular open end of a different ball member;
a tension wire adjustably attached to and located between said end members;
a fluid-bearing seal located between said ball members to seal, with a limited amount of leakage, the space between said members being defined by the opposing outer surface of the inner ball member and the inner surface of the outer ball member;
a second seal between the truncated end of the outer ball member and the outer surface of the inner ball member, the second seal being spaced from the fluid-bearing seal to form a seepage space in which leakage fluid from the fluid-bearing seal accumulates; and
means for draining the leakage fluid from the seepage space.

4,619,291
DUCT FOR CABLE

Said Shirian, Forest Hills, N.Y., assignor to Nynex Corporation, New York, N.Y.

Filed Oct. 23, 1984, Ser. No. 663,875
Int. Cl.[4] F16L *9/22*
U.S. Cl. 138—109 17 Claims

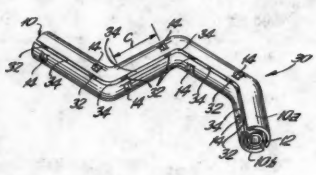


1. A duct for use in housing a cable comprising:
a tubular member having elongated barrel and bell portions, the bell portion being of larger diameter than the barrel portion;
and means disposed within said barrel portion for segmenting said barrel portion into compartments, said segmenting means having a first section in said barrel portion and a second section which follows said first section and extends into said bell portion, said first section having a first end in said barrel portion and extending therefrom through said barrel portion toward said bell portion to a second end of said first section, said first section comprising one or more pairs of spaced first walls extending along the length of said barrel portion, said second section having a first end which follows said second end of said first section and extends to a second end of said second section in said bell portion, said second end of said second section being of a configuration to interfit with said first end of said first section, and said second section comprising a second wall for each of said pairs of spaced first walls, each of said second walls following its corresponding pair of spaced first walls and having a thickness which is less than the spacing between the corresponding pair of first spaced walls.

4,619,292
AIR GAP PIPE

Jon W. Harwood, Toledo, Ohio, assignor to APX Group, Inc., Toledo, Ohio

Continuation of Ser. No. 541,709, Oct. 14, 1983, Pat. No. 4,501,302. This application Jan. 30, 1985, Ser. No. 696,311
Int. Cl.[4] F16L *9/18*
U.S. Cl. 138—113 7 Claims



1. A non-linear air gap pipe for carrying heated exhaust gases from an engine, said air gap pipe comprising:
an inner pipe bent into a selected non-linear configuration for carrying the exhaust gases from the engine; and
an outer pipe disposed generally concentrically around the inner pipe along substantially their entire respective non-linear lengths with an air gap therebetween, said air gap pipe including a plurality of supports extending between and contacting both the inner pipe and the outer pipe, said outer pipe being formed by first and second longitudinal halves with said first and second halves being joined together at selected locations along opposed longitudinal sides of said other pipe, said selected locations being spaced from one another along at least one longitudinal side of said outer pipe to define vents between said selected locations.

4,619,293
CIRCULAR LOOM

Franz X. Huemer, Sonnenuhrgasse 4, 1060 Vienna, Austria

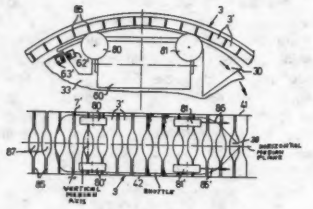
Filed May 22, 1985, Ser. No. 736,786
Claims priority, application Switzerland, Jun. 8, 1984, 2799/84
Int. Cl.[4] D03D *37/00*
U.S. Cl. 139—13 R 6 Claims

1. In a circular loom having a circular reed traversed by warp yarn to which a shedding motion is imparted and in which at least one weaving shuttle rotates in the reed, the improvement wherein said reed comprises:

an upper circular shuttle race,

a lower circular shuttle race, and

a multiplicity of strips extending between said races and defining between them guide passages equispaced around the reed and each accommodating two yarns which cross substantially at a horizontal median plane through said reed during shedding motion of said yarns, each of said passages comprising an upper and a lower narrow slit extending from said upper and said lower races respectively in the direction of said median plane and widening to join at said median plane whereby each of said narrow slits accommodates a respective yarn in the region of the



respective race when a shed is formed and the widened portions of said passages at said median plane permit the yarns of said passage to cross past one another without interference during a shed changeover movement of said yarns at a warp crossing space; and

said shuttle is provided with pairs of rollers respectively at a top edge for engagement with said upper race and at said bottom edge for engagement with said lower race whereby said rollers of said shuttle ride on said races as said shuttle is biased outwardly by centrifugal force, said slits extending below said upper and lower races to receive said yarns and recess them below respective surfaces of said races on which said rollers run.

4,619,294

METHOD OF AND APPARATUS FOR CONTROLLING MOTOR-DRIVEN LET-OFF AND TAKE-UP SYSTEM FOR LOOMS

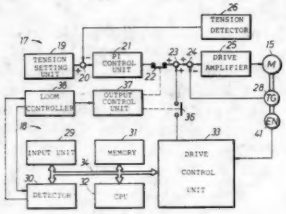
Tsutomu Sainen, and Takeshi Asai, both of Kanazawa, Japan, assignors to Tsudakoma Corp., Kanazawa, Japan

Filed Jan. 17, 1985, Ser. No. 692,273

Claims priority, application Japan, Jan. 20, 1984, 59-008956

Int. Cl.[4] D03D *49/06*

U.S. Cl. 139—99 **5 Claims**



1. A method of controlling motor-driven let-off and take-up motions in a loom, comprising the steps of:

(a) controlling the rotation of a motor for driving an object with a tension control system operating in response to a signal indicative of a target tension and a feedback input signal indicative of an actual tension of the object during a normal operation of the loom;

(b) controlling the rotation of the motor with a feedforward control system during a transient operation of the loom, said feedforward control system storing operation patterns of directions and speeds of rotation and an angular displacement of the motor for respective operation modes and weaving condition of the loom;

(c) detecting an operation mode of the loom at the time of the transient operation;

(d) reading an appropriate operation pattern from the feedforward control system based on the detected operation mode; and

(e) applying the read operation pattern as a control signal to a drive control system for the motor.

2. An apparatus for controlling let-off and take-up motions in a loom, comprising:

(a) a first control apparatus of a tension control system for controlling an object; and

(b) a second control apparatus of a feedforward control system for controlling the object,

(c) said first control apparatus including:

(1) a tension setting unit for generating a signal indicative of a target tension for the object;

(2) a tension detector for detecting an actual tension of the object and generating a feedback signal;

(3) a PI control unit for effecting PI operation on the target tension signal and the feedback signal; and

(4) a drive amplifier for controlling a motor for driving the object based on a PI output signal from said PI control unit, and

(d) said second control apparatus including:

(1) an input unit for entering operation data items of directions and speeds of rotation and an angular displacement of the motor for respective operation modes and weaving conditions of the loom;

(2) a memory for storing the operation data items from said input unit as a plurality of operation patterns;

(3) a detector for detecting an operating condition of the loom upon a transient operation of the loom;

(4) a central processing unit for reading an appropriate operation pattern dependent on the detected operating condition from said memory and generating a control signal; and

(5) a drive control unit responsive to the control signal from said central processing unit for driving the motor based on a given speed pattern.

4,619,295

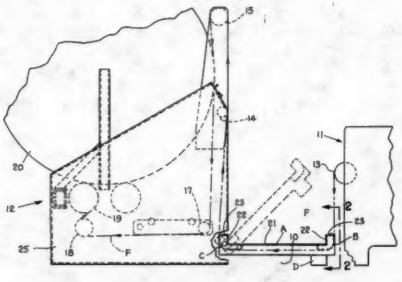
WEAVER'S PLATFORM

William J. Alexander, P.O. Box 761, Mauldin, S.C. 29662

Filed Apr. 15, 1985, Ser. No. 723,570

Int. Cl.[4] D03D *49/20*

U.S. Cl. 139—304 **1 Claim**



1. A weaver's platform for use in the weaver's aisle area between a textile loom and an off the loom cloth takeup comprising:

an elongated rectangular walkway disposed between said

textile loom and said cloth takeup positioned forwardly of the loom;

a pair of spaced arcuate supports positioned transversely with one of said supports adjacent each side of said elongated rectangular walkway for facilitating the passage of cloth beneath said walkway and for reinforcing and bracing said walkway for adding rigidity thereto;

said walkway including a transverse pivotal support carried adjacent one of said arcuate supports;

a support means for carrying the walkway adjacent the other of said arcuate supports;

said arcuate supports being curved sheet portions; and

said walkway being pivoted to said cloth takeup above said adjacent sheet metal portion;

whereby said walkway may be pivoted upwardly for easy removal from the aisle for clean out of the area between the loom and the cloth takeup while facilitating passage of cloth from the loom to the takeup.

4,619,296
WEFT INSERTING NOZZLE FOR JET LOOMS

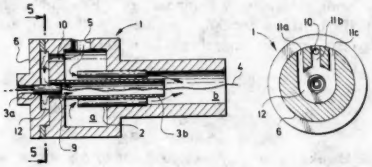
Miroslav Hrus; Vladimir Svaty; Pavel Sidlof, and Oldrich Fisar, all of Liberec, Czechoslovakia, assignors to Elitex, textilniho strojirenstvi, Liberec, Czechoslovakia

Filed Aug. 23, 1985, Ser. No. 768,952

Claims priority, application Czechoslovakia, Aug. 23, 1984, 6384-84

Int. Cl.[4] D03D *47/30*

U.S. Cl. 139—435 **5 Claims**



1. A nozzle for the insertion of weft threads in pnenumatic jet looms, wherein means are provided to allow air to enter said nozzle and wherein said nozzle comprises a body in which there are disposed air channels into which the air enters and at least one weft thread guide arranged in the nozzle body, and means operable to cause the air to rotate and to produce a change in the direction and speed of rotation of the air passing through the nozzle, said last named means comprising means for adjusting the position of the air channels with respect to the weft thread guide.

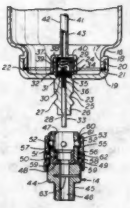
4,619,297
REFILLABLE PRESSURE SPRAY CONTAINER

Kenneth E. Kocher, 6030 Glenmont, Apt. 10, Houston, Tex. 77081

Filed Dec. 24, 1984, Ser. No. 686,004

Int. Cl.[4] B65B *31/00*

U.S. Cl. 141—20 **20 Claims**



15. A refillable pressurizable container for use in a pressure spray system having a motor driven gas compressor with a gas inlet and an outlet for compressed gas, a quick disconnect coupling having first and second separable parts having a spring-loaded sleeve and ball detents for quick assembly and disassembly , said first quick disconnect coupling part being rigidly secured in a fixed position on said compressor outlet and extending vertically upward therefrom, including valve means, supported in a fixed position on said compressor outlet and in said quick disconnect coupling adapted to be open when said quick disconnect coupling is in a connected position for flow of compressed gas through said coupling into said container and adapted to be closed on separation of said quick disconnect coupling parts,

said pressurizable container comprising

a refillable pressurizable container adapted to be removably secured on and communicating with said compressor outlet in an inverted position comprising a pressure-resistant container having one open end,

a removable cap closing and sealing said open end,

a filling and dispensing nozzle extending outwardly from said cap, and

a hollow tubular stem extending inwardly from said cap into said container to a point near the bottom end of said container,

said pressurizable container further comprising said second quick disconnect coupling part, said second quick disconnect coupling part comprising part of said nozzle and fitting said first quick disconnect nozzle part to form a passage from said compressor to the interior of said container for pressurizing the same, and

valve means adapted to be open when said quick disconnect coupling is in a connected position for flow of compressed gas through said coupling into said container and adapted to be closed on separation of said quick disconnect coupling parts,

said container being adapted to be removed by separation of said quick disconnect coupling by operation of said spring-loaded sleeve, after filling, for use in spraying.

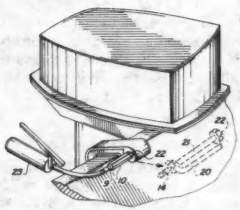
4,619,298
CABLE GREASING ADAPTOR

Ronney L. Broussard, Pollock, La., assignor to Antonia Products, Inc., Jena, La.

Continuation-in-part of Ser. No. 532,206, Sep. 14, 1983. This application Mar. 11, 1985, Ser. No. 710,474

Int. Cl.[4] B65B *3/04*

U.S. Cl. 141—384 **20 Claims**



19. A five-piece apparatus for lubricating a cable and cable housing comprising:

a. an elongated, hollow, one-piece first body means for receiving and conveying lubricant from a lubricant source through the hollow portion thereof to a cable housing, said first body means having a first end and a second end, said first end having a hole therein for receipt of a grease fitting means, said second end having threads on the inside thereof, said first body means being constructed from a single continuous piece of rigid material,

b. an elongated, hollow, one-piece second body means for

receiving and conveying lubricant from said first body means to a cable housing, said second body means having a first and second end having external threads thereon, said threads on said first end being adapted for receipt in said threads on said first body means,

c. washer means for forming a seal with said cable housing, said washer means having a hole in the center thereof for receipt of said cable housing,

d. nut means having internal threads therein for receipt of said external threads located on said second end of said second body means, said nut means having a threaded first hole in one end thereof for receipt of said second end of said second body means and a second hole in the other end thereof for receipt of said cable housing means, and

e. grease fitting means rigidly connectable to said main body means for conveying lubricant from a grease gun to said main body means.

4,619,299

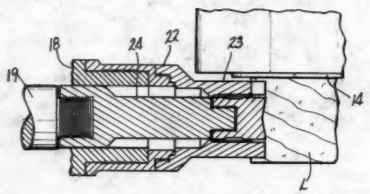
LOG-PEELING LATHE

Sterling B. Platt, Stamford, Conn., assignor to Champion International Corporation, Stamford, Conn.

Filed Jun. 24, 1985, Ser. No. 747,916

Int. Cl.[4] B27C *7/04*

U.S. Cl. 144—357 **13 Claims**



4. A log peeling lathe comprising:

(a) inner and outer spindles rotatably journalled on the lathe;

(b) inner and outer dogs mounted on said inner and outer spindles respectively for supporting ends of logs being peeled in the lathe, said inner dogs nesting in said outer dogs;

(c) retraction means for selectively retracting said inner and outer dogs away from the ends of a log in the lathe;

(d) measuring means for determining the round up size of a log in the lathe;

(e) sensing means operable to sense when a log has been rounded up in the lathe; and

(f) control means connected to said measuring means and to said sensing means, said control means being operable to actuate said measuring means to measure the size of a log in the lathe when said sensing means has sensed that the log in the lathe is rounded up.

4,619,300

PNEUMATIC TIRE TREAD

Seiichiro Tokunaga, Higashimurayama, and Nobumasa Ikeda, Kodaira, both of Japan, assignors to Bridgestone Corporation, Japan

Filed Nov. 29, 1984, Ser. No. 676,332

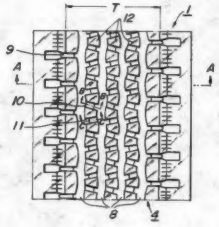
Claims priority, application Japan, Nov. 30, 1983, 58-224512; Mar. 29, 1984, 59-59475

Int. Cl.[4] B60C *11/03*

U.S. Cl. 152—209 R **39 Claims**

1. An all season type pneumatic tire which is to be used throughout a year from a winter season through a summer season and comprises:

a tread pattern formed in a tread portion divided into separated blocks at an outer surface of a tread rubber layer in at least a central region of said tread portion by a plurality of main grooves extending circumferentially and a large number of lateral grooves each extending toward a cross direction to each of said main grooves and having a shallower portion as compared with said main groove, said tread portion being a cap-base composite tread portion composed of an upper rubber layer forming a pattern of blocks and a lower rubber layer bordered on said upper rubber layer just therebeneath by a face connecting groove bottoms of said shallower portions of lateral grooves and forming a pattern of ribs separated from one



another by said main grooves in the lateral direction and extending substantially continuously in the circumferential direction, and said upper rubber layer being substantially composed of a cap rubber having a JIS hardness at −20° C. of not more than 75° and said lower rubber layer being substantially composed of a base rubber having a JIS hardness at 100° C. of not less than 54° and a loss tangent of not more than 0.22 at 50 Hz, 25° C. and a strain of 2%.

4,619,301

SPIKE TIRE

Eizo Hiroki, Sapporo, Japan, assignor to Agency of Industrial Science and Technology, Tokyo, Japan

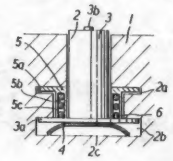
PCT No. PCT/JP83/00443, § 371 Date Aug. 13, 1984, § 102(e) Date Aug. 13, 1984, PCT Pub. No. WO84/02497, PCT Pub. Date Jul. 5, 1984

PCT Filed Dec. 19, 1983, Ser. No. 642,689

Claims priority, application Japan, Dec. 23, 1982, 57-234308; Mar. 14, 1983, 58-042915; Mar. 29, 1983, 58-054665

Int. Cl.[4] B60C *11/14*

U.S. Cl. 152—210 **9 Claims**



1. A spike tire for a vehicle, said tire having a tread surface, comprising:

a pin receptacle hole provided in said tread surface of said tire;

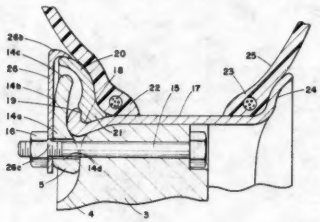
a spike pin retractably protrudable from said pin receptacle hole;

biasing means for constantly urging said spike pin to protrude from said pin receptacle hole; and

shape memory alloy actuating means for automatically restoring a memorized shape when warmed to a predetermined temperature by the heat generated in said tire as a result of operation of said vehicle on a non-frozen or snow-free road surface and for automatically retracting

said spike pin into said tire against the action of said biasing means.

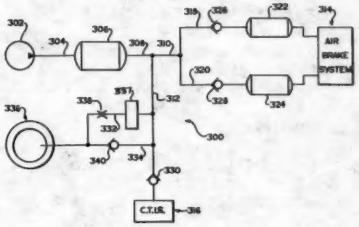
4,619,302
RIM AND TIRE CLAMP
Asa B. Mellor, Rte. 6, Box 131, Millersburg, Ohio 44654
Filed Sep. 24, 1984, Ser. No. 653,900
Int. Cl.[4] B60C *5/16*
U.S. Cl. 152—398 **3 Claims**



1. A multi-piece rim and wheel construction for retaining an associated tire thereon, said rim and wheel construction comprising:
- a wheel having a central axle connecting portion and radially extending spokes extending outwardly therefrom;
- a rim mounted adjacent an outer end of said radially extending spokes, said rim having a substantially cylindrical body, a first tire bead engaging flange at one edge and a lock ring receiving portion at the other edge;
- a lock ring received in said lock ring receiving portion at an inner radial position, said lock ring including a second tire bead engaging flange extending radially outward to an outer radial position whereby an associated tire is retained between said tire bead engaging flanges;
- a clamp on said wheel having a first body portion fixedly retained to said wheel at an innermost radial position, a flange engaging portion extending outwardly adjacent to said lock ring inner radial position, and a tongue portion extending outwardly from said flange engaging portion to a position adjacent said lock ring outer radial position for inhibiting axial displacement of said lock ring; and,
- a stop member fixedly retained to said ring extending continuously from said innermost radial position to an outermost radial position engaging an outer circumferential edge of said lock ring whereby an additional safety factor is incorporated into said construction.

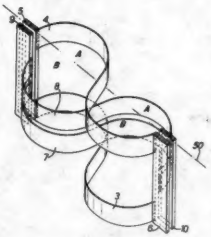
4,619,303
VEHICLE AIR SYSTEM INCLUDING CENTRAL TIRE INFLATION SYSTEM
Lannie R. Bryan, Northville, and Gary R. Schultz, Novi, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio
Filed Jun. 4, 1984, Ser. No. 617,648
Int. Cl.[4] B60C *23/00, 29/00*
U.S. Cl. 152—416 **7 Claims**

1. A vehicle air system for a vehicle equipped with air brakes, a central tire inflation system and a central tire inflation system pressurized fluid reservoir for storing pressurized fluid therein for charging both said vehicle air brake system and said central tire inflation system said vehicle air system comprising:
- a source of pressurized fluid;
- a first conduit fluidly connected to said source;
- a second fluid conduit fluidly connecting said first conduit to said vehicle air brake system;
- a first one-way check valve associated with said second conduit, said first one-way check valve allowing fluid to flow from said first conduit to said brake system only;
- a third fluid conduit fluidly connected to said first conduit and to said central tire inflation system;
- a fourth conduit fluidly connecting said third conduit to said central tire inflation system reservoir, said fourth conduit including a fluid flow restriction therein limiting the flow of fluid therethrough;
- a fifth conduit fluidly connecting said third conduit to said central tire inflation system reservoir;
- said fourth conduit and said fifth conduit defining parallel fluid conduit paths from said third conduit to said central tire inflation system reservoir



- a second one-way check valve associated with said fifth conduit for controlling the flow of fluid therethrough, said second one-way check valve allowing fluid to flow from said central tire inflation system reservoir to said third conduit only
- whereby pressurized fluid stored in said central tire inflation system reservoir can charge both said central tire inflation system and said air brake system.

4,619,304
HINGES
Michael T. Smith, Swanley, England, assignor to Courier Display Systems Limited, London, England
Filed Nov. 17, 1982, Ser. No. 442,307
Claims priority, application United Kingdom, Feb. 15, 1982, 8204362; Oct. 28, 1982, 8230870
Int. Cl.[4] E05D *1/00;* **G09F** *15/00*
U.S. Cl. 160—135 **21 Claims**



1. A hinged structure comprising:
- first and second cylindrical supports disposed in parallel, and having axes which generate a plane, and respective first and second surfaces disposed on opposite sides of said plane;
- at least one hinge having a first and second S-shaped strip made out of a resiliently flexible material, each strip passing partially around each support, said first strip passing along the first surface of the first support, between said two cylinders and along the second surface of said second support said first and second surfaces being outer surfaces, said second strip passing along the second surface of said first support and the first surface of said second support, and said first strip having opposed ends, and said second strip having opposed ends; and
- at least two independent tensioning means external of and

contiguous with said first and second cylindrical supports and being attached to said opposed ends of the strips and mounted on said supports.

4,619,305

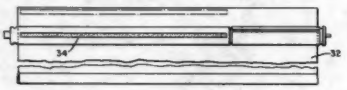
SEMI-ADJUSTABLE SHADE AND ROLLER COMBINATION

Paul E. Comeau, Warwick, R.I., assignor to Kenney Manufacturing Company, Warwick, R.I.

Filed Mar. 25, 1985, Ser. No. 715,390

Int. Cl.[4] A47G *5/02*

U.S. Cl. 160—263 4 Claims



1. A semi-adjustable roller shade, comprising:

(a) a sheet of essentially flexible but non-stretchable material in the form of a shade cut to the width of a given one of several standard width increments, having top, bottom, and side margins;

(b) a telescoping roller assembly comprising:

an outer roller of sheet metal formed into an essentially uniform cylindrical shape on its outer surface with a lock-seam of several thicknesses of said metal extending inwardly on the inner surface thereof, and

an inner roller of sheet metal formed into a cylindrical shape and dimensioned to fit into said outer roller in smooth sliding telescoping relation, and with a longitudinal groove in the outer surface thereof dimensioned to receive the lock-seam of the outer roller;

(c) the length of the outer roller being slightly less than the width of a shade of the next narrower width increment, and the length of the inner roller being substantially more than the width dimensional difference between said given one standard width and said next narrower standard width;

(d) said inner roller positioned in said outer roller and extending outwardly thereof sufficiently to make the length of said roller assembly at least equal to said given one standard width;

(e) the top margin of said shade connected to said larger roller;

(f) a split sleeve of essentially stiff but resilient sheet material having a thickness equal to the difference in outside diameter between said outer and inner rollers, mounted on said inner roller;

(g) a flanged head having an outside diameter greater than the outside diameter of the outer roller mounted on the end of the inner roller opposite the outer roller such that said sleeve is held between the outer roller and the flanged head; and

(h) the shade rolled up on said roller assembly, whereby the side margin of said shade overlying said split sleeve may be cut to give the shade a desired width between said one given standard width and the next narrower standard width with said sleeve supporting said shade material for cutting across the groove in said inner roller, and whereby said sleeve may then also be cut and sprung open to remove the cut portion from the inner roller, with enlarged flanged head, and the inner roller may then be pushed in without risk of pushing it in too far to provide a trimmed shade of the desired width.

4,619,306

QUALITY CONTROL IN MULTIPLE CONTINUOUS CASTING PLANTS

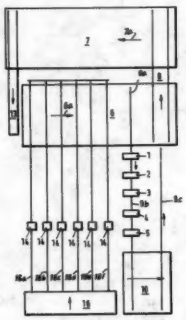
Hans Gruner, Duisburg; Helmuth Orsech, and Hans Schrewe, both of Düsseldorf, all of Fed. Rep. of Germany, assignors to Mannesmann Aktiengesellschaft, Duesseldorf, Fed. Rep. of Germany

Filed Oct. 11, 1983, Ser. No. 540,631

Claims priority, application Fed. Rep. of Germany, Oct. 13, 1982, 3238346

Int. Cl.[4] B22D *11/16*

U.S. Cl. 164—150 18 Claims



1. In a facility for continuous casting of multiple casting strands in parallel, there being a plurality of molds and corresponding cutters for forming and separating each casting strand in a line and path of casting from the molds, into respective billets, the improvement comprising:

a first transversely operating transport means cooperating with all said casting paths to receive all of said billets in spaced apart relation but transporting them into a common direction extending transversely to the respective direction of casting of each of the billets as defined by the respective casting path;

an inspection line parallel to the casting paths and transverse to the first transport means and including a second longitudinal transporting means for selectively receiving and transporting specified billets to be inspected from said first transport means and moving the received billets to the inspection line there being at least one inspection station arranged along the inspection line;

a third transport means coupled to both the inspection line and to the first transverse transport means for transporting inspected billets as well as uninspected billets; and

a cooling facility connected to the third transport means for receiving all of said billets from the said third transport means and as combined therein, for purposes of cooling.

4,619,307

APPARATUS FOR COMPRESSING FOUNDRY MOULDING MATERIAL BY PRESSURE GAS

Günter Müller, Karlsruhe, and Norbert Damm, Karlsdorf-Neuthard, both of Fed. Rep. of Germany, assignors to BMD Badische Maschinenfabrik Durlach GmbH, Karlsruhe, Fed. Rep. of Germany

PCT No. PCT/EP 84/00392 § 371 Date Aug. 2, 1985, § 102(e) Date Aug. 2, 1985, PCT Pub. No. WO 85/02568, PCT Pub. Date Jun. 20, 1985

PCT filed Aug. 2, 1985, Ser. No. 767,274

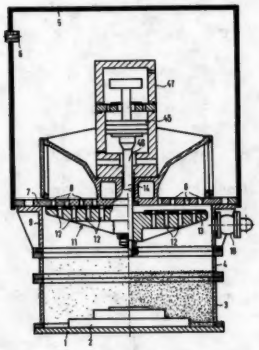
Claims priority, application Fed. Rep. of Germany, Dec. 9, 1983, 3344520

Int. Cl.[4] B22C *15/00*

U.S. Cl. 164—169 12 Claims

1. Apparatus for the compression of foundry moulding material by means of pressure or compression gas comprising a pressure vessel for the pressure gas forming an initial pressure chamber, a moulding chamber positioned below the pressure

vessel and comprising a moulding box with a sand frame and a pattern plate with a pattern closing off the moulding box at the bottom and onto which the moulding material is loosely heaped up prior to compression and a large-area valve arranged between the pressure vessel and the moulding chamber and whose closure member releases the valve opening in a few milliseconds under the joint action of the pressure in the pressure vessel, moves into the moulding chamber and can be brought into the closed position by means of a pressure cylin-



der, characterized in that on the lift or stroke side, the piston (45) of the pressure cylinder (47) is connected to a high pressure source (41) and with its opposite side forms the movable termination of a pressure reservoir (51) subject to the action of the gas and that the high pressure side outflow (44, 48, 61, 64) is constructed in such a way that the pressure flows out at a speed of >10 m/s, accompanied by the simultaneous acceleration of the piston (45) under the pressure in the pressure reservoir (51) and the closure member (11) into the open position.

4,619,308

MOLD FOR HORIZONTALLY AND CONTINUOUSLY CASTING MOLTEN METAL INTO CAST METAL STRAND

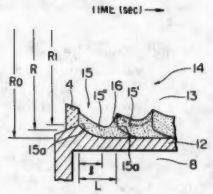
Takaho Kawawa, Tokyo, Japan, assignor to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed May 16, 1985, Ser. No. 734,771

Claims priority, application Japan, Jun. 4, 1984, 59-113145

Int. Cl.[4] B22D *11/04*

U.S. Cl. 164—416 **7 Claims**



1. In a horizontal type continuous casting machine for horizontally and continuously casting molten metal into a cast metal strand, and including a horizontal mold and means for cyclically pulling and pushing the cast metal strand during formation thereof, comprising:

connecting means including at least a front nozzle, a feed nozzle and a break ring, for connecting said horizontal mold to an opening in a lower portion of a side wall of a tundish for a horizontal type continuous casting machine, one end of said front nozzle being inserted into said opening in the lower portion of said side wall of said tundish, the other end of said front nozzle being in contact with one end of said feed nozzle, the other end of said feed nozzle being in contact with one end of said break ring, the other end of said break ring being in contact with an inner bore of said mold at an inlet end thereof, thereby said opening in the lower portion of said side wall of said tundish, said front nozzle, said feed nozzle, said break ring and said inner bore of said mold forming a horizontal passage for molten metal, molten metal received in said tundish being intermittently and continuously withdrawn into a cast metal strand in the horizontal direction through said mold by means of a plurality of cycles each comprising one pull and one push, and a distance (L) of said one pull being longer than a distance of said one push; and

the transverse sectional area of said inner bore for said inlet end portion of said mold becomes gradually larger from said inlet end of said mold toward the middle portion thereof over a prescribed distance (l), and said inner bore has substantially the same transverse sectional area for the remaining portion of said mold other than said inlet end portion over said prescribed distance (l);

the improved mold wherein:

said prescribed distance (l) at said inlet end portion of said mold (12, 17 or 18) is equal to or less than said distance (L) of said one pull in each cycle for said withdrawal of said cast metal strand.

4,619,309

NOZZLE FOR STRIP CASTING

Ernst Huber, Schaffhausen; Wolfhart Rieger, Buch, and Martin Bolliger, Sierre, all of Switzerland, assignors to Swiss Aluminium Ltd., Chippis, Switzerland

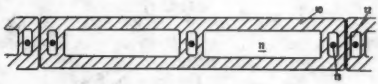
Continuation of Ser. No. 280,553, Jul. 2, 1981, Pat. No. 4,485,835, which is a continuation of Ser. No. 7,446, Jan. 29, 1979, Pat. No. 4,290,477. This application Jun. 21, 1984, Ser. No. 622,873

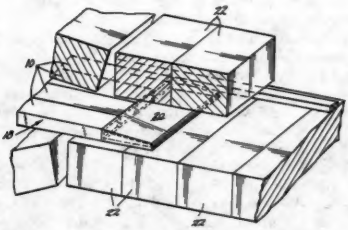
Claims priority, application Switzerland, Jan. 30, 1978, 991/78

The portion of the term of this patent subsequent to Sep. 22, 1998, has been disclaimed.

Int. Cl.[4] B22D *11/06*

U.S. Cl. 164—430 **7 Claims**





1. An apparatus for the continuous casting of molten metal comprising in combination a caterpillar track type mold and a nozzle for feeding said molten metal to said mold, the improvement comprising:

a nozzle comprising a plurality of individually separable hollow elongated tubular sections, each of said sections having a peripheral wall defining at least one feed channel, said plurality of sections being mounted in side by side

relationship such that a portion of said peripheral wall surface of one of said plurality of sections abuts a portion of said peripheral wall surface of another of said plurality of sections.

4,619,310

SUPPORTING AND GUIDING APPARATUS CONTINUOUS ROUNDS CASTING

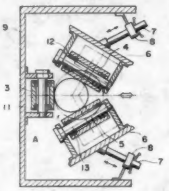
Tsuyoshi Andoh; Toshio Kanamori, both of Niihama; Takashi Yamaguchi, Wakayama; Hiroshi Tomono, Wakayama, and Satoshi Satake, Wakayama, all of Japan, assignors to Sumitomo Heavy Industries, Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan

Filed Nov. 27, 1984, Ser. No. 675,316

Claims priority, application Japan, Nov. 30, 1983, 58-226640

Int. Cl.[4] B22D *11/128*

U.S. Cl. 164—448 **20 Claims**



1. A supporting and guiding apparatus for continuous rounds casting which supports and guides a round drawn from a mold of a continuous casting machine with a plurality of rolls disposed around said round, comprising:

a plurality of sets of rolls, each set being disposed along a drawing direction of said round and composed of three rolls which are disposed around a periphery of said round; and

at least one roll of each set being fixed relative to said round and the remaining rolls being fixedly adjustable in a direction toward and away from a centerline of the drawing direction so as to accept various size rounds.

4,619,311

EQUAL VOLUME, CONTRAFLOW HEAT EXCHANGER

Carmine F. Vasile, and Sheila F. Vasile, both of 4 Cordwainer La., Huntington, N.Y. 11743

Filed Jun. 28, 1985, Ser. No. 749,662

Int. Cl.[4] F24H *3/00*

U.S. Cl. 165—47 **4 Claims**

1. An apparatus for use in combination with a water heating system wherein the system includes

(1) a cold water feed;

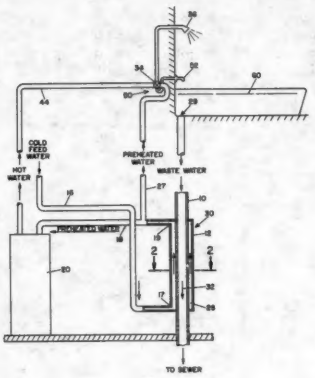
(2) a water heater having an inlet connected to the cold water feed and a hot water outlet, and

(3) a facility connected to the cold water feed and the hot water outlet and having a waste pipe for carrying mixed hot and cold water, the facility having a means for mixing the cold and hot water and immediately providing the mixed water to the waste pipe;

said apparatus comprising:

(a) first means including a cylindrical member connected to the waste pipe for directing the flow of the mixed hot and cold water in the form of a film spiraling downward over the inner surface of the cylindrical member; and

(b) second means connected in-line with the cold water feed prior to the cold water feed connections to the facility and prior to the cold water feed connections to the water heater for directing the flow of cold water flowing in the cold water feed upward in contact with the outer surface of the cylindrical member, said second means directing the cold water flowing in contact with the outer surface of the cylindrical member in a direction opposite to the direction of flow of the mixed hot and cold water flowing in contact with the inner surface of the cylindrical member whereby the volume of water flowing through the



first means is equal to the volume of the water flowing through the second means.

4,619,312

VENTILATING WALL ELEMENT

Olavi O. Paljakka, Stenbockens gata 114 6tr, S-136 62 Handen, Sweden

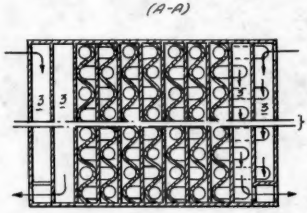
PCT No. PCT/SE83/00054, § 371 Date Oct. 24, 1983, § 102(e) Date Oct. 24, 1983, PCT Pub. No. WO83/02972, PCT Pub. Date Sep. 1, 1983

PCT Filed Feb. 21, 1983, Ser. No. 551,993

Claims priority, application Sweden, Feb. 24, 1982, 8201142-0

Int. Cl.[4] B01J *8/00*

U.S. Cl. 165—57 **1 Claim**



1. A ventilating wall element for ventilation and heat insulation between an inside and an outside space subject to different temperatures, where air from these spaces is conducted subject to induced pressure through a system of ducts so that the air from one space is separated from the air from another space by thin wall means for exchanging heat and humidity therebetween, the improvement comprising said element having a wall surface, a plurality of ducts extending parallel to said wall surface, a plurality of connecting duct means, each connecting duct means interconnecting a pairs of said parallel extending ducts at one of their respective ends to form a plurality of parallel S-shaped, uniplanar air flow paths, air being conducted in opposite directions through adjacent ducts, some of said air flow paths being exposed to air from one of said spaces and others of said air flow paths being exposed to air from the other of said spaces so that adjacent air flow paths carry air from different ones of said spaces;

and further comprising means for equalizing pressures between said some and said other parallel extending ducts, said pressure equalizing means including: (a) a first cham-

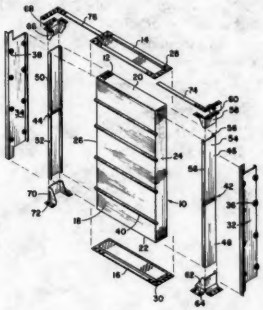
ber having a shock absorbing capacity for receiving inlet air, and (b) a second chamber having a shock absorbing capacity for containing outlet air, said pressure equalizing means thereby functioning as a shock absorber and minimizing the coupling of air turbulence from one space to the other space.

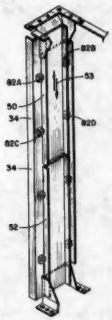
4,619,313

RADIATOR FRAME UNIT

Wayne A. Rhodes, Larray, and Kenneth D. Harrington, Jackson, both of Tenn., assignors to Touchstone Railway Supply & Mfg. Co., Inc., Jackson, Tenn.

Filed Oct. 12, 1984, Ser. No. 660,461
Int. Cl.[4] F28F *9/00*
U.S. Cl. 165—67 **13 Claims**





1. A radiator assembly including:

a cooling core having two opposite sides;

a side rail on each side of said cooling core, each said side rail having an exterior side and an interior side;

a push-pad unit on each side of said core between said side rail and said cooling core, each said push-pad unit having a first section fixed to said side rail and a second section movable with respect to said side rail, said first section and said second section being in non-overlapping relationship;

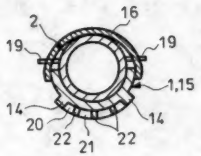
means to hold said side rails together.

4,619,314

DEVICE FOR PREVENTING WEAR OF HEAT TRANSFER TUBES IN FLUIDIZED-BED BOILER

Hiromi Shimoda, Hasuda, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Japan

Filed Jul. 27, 1984, Ser. No. 635,244
Claims priority, application Japan, Aug. 5, 1983, 58-143563; Aug. 5, 1983, 58-121903[U]; Jan. 20, 1984, 59-6539[U]
Int. Cl.[4] F28F *19/00*
U.S. Cl. 165—104.16 **5 Claims**



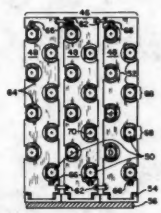
1. A device for protecting wear of a heat transfer tube in a fluidized bed boiler wherein a lower surface of said tube is exposed to a strong attack from fluidized bed materials, said device comprising a protector made of a wear-resisting material having a substantially semi-circular shape in cross-section so as to cover only said lower surface of said tube, means for attaching said protector to said tube, means on said tube for preventing the displacement of said protector in the axial direction of the tube and the rotation of the protector about said tube, and studs attached to the outer surface of said protector.

4,619,315

FLUIDIZED BED BOILER IN-BED TUBE SUPPORT BRACKET

Richard E. Waryasz, Longmeadow, Mass., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Apr. 10, 1985, Ser. No. 721,819
Int. Cl.[4] F28C *3/16*; F28F *9/00*
U.S. Cl. 165—104.16 **4 Claims**



1. In a fluidized bed system having a tubular heat exchange bundle immersed within a bed region of the fluidized bed which includes a plurality of axially parallel vertically and horiztonally spaced tubes having an outside diameter arrayed in horiztonal rows and vertical columns through which a working fluid is passed in heat exchange relationship with the bed region, an inner bank tube support structure for supporting the tubes of the tubular heat exchange bundle comprising:

a. a pluralithy of vertically spaced plates extending transversely between adjacent vertical columns of heat exchange tubes, each plate transmitting the mechanical load of a predetermained portion of the immersed heat exchange tubes to a support member therebeneath, each plate having an edge and a plurality of substantially circular openings along and intersecting the edge of each plate, each opening having a diameter greater than the outside diameter of a heat exchange tube whereby each opening is adapted to encompass a heat exchange tube in spaced

relationship therewith, the length of the intersection of the substantially circular opening with the edge of each plate being a chord of the substantially circular opening that is substantially the outside diameter of a heat exchange tube, the vertical and horizontal spacing of the openings being such as to correspond to the vertical and horizontal spacing of the in-bed heat exchange tubes being supported; and

b. a plurality of wear inserts, at least one wear insert per tube, disposed to surround at least a portion of each heat exchange tube in the region of support intermediate the outside diameter of the heat exchange tube and the opening in the plate encompassing the heat exchange tube so as to span the space therebetween.

4,619,316

HEAT TRANSFER APPARATUS

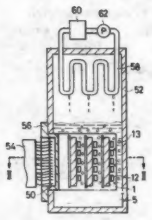
Wataru Nakayama, Kashiwa; Tadakatsu Nakajima, Ibaraki; Shigeki Hirasawa, Ibaraki; Akiomi Kohno, Ibaraki, and Takaji Takenaka, Hatano, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,715

Claims priority, application Japan, Apr. 27, 1984, 59-83708

Int. Cl.[4] F28D *15/00;* **H01L** *23/44*

U.S. Cl. 165—104.33 **4 Claims**



1. In an apparatus wherein heat conductive members are disposed on respective surfaces of a plurality of heat generating bodies immersed in a liquid coolant, and heat of the heat generating bodies is removed by boiling of the liquid coolant; a heat transfer apparatus characterized in that each heat conductive member is formed with a plurality of layers of first cavity groups and second cavity groups which extend elongately in a manner to be partitioned by thermally-conductive plate members, said first cavity groups and said second cavity groups being stacked alternately in a direction perpendicular to the surface of the corresponding heat generating body, said first cavity groups being adapted to restrict vapors generated in each cavity of said first cavity groups from flowing out of said cavity and stably hold the vapors in said cavity, while said second cavity groups have open ends through which the liquid coolant in each cavity of the second cavity groups flows directly and the vapors generated in the cavity of said second cavity groups flows out directly to the outside of the cavity of said second cavity groups and, that said plate members are provided with openings which bring into communication said first cavity groups and said second cavity groups of the layers adjoining each other and a cavity group of the outermost layer and an outer space of said heat conductive member.

4,619,317

HEAT EXCHANGER

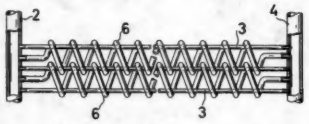
Dieter Disselbeck, Bad Soden am Taunus, and Hans-Peter Vollrath, Eppstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

Filed Jun. 6, 1984, Ser. No. 617,692

Claims priority, application Fed. Rep. of Germany, Jun. 8, 1983, 3320632

Int. Cl.[4] F28D *7/00*

U.S. Cl. 165—162 **8 Claims**



1. A heat exchanger, comprising a support frame and a feed line, a header for the forward flow, heat exchange tubes, a header for the return flow and a discharge line for a heat exchange medium, the heat exchange tubes including a plurality of individual helical capillary tubes (3) each extending between the forward flow header (2) and the return flow header (4), the axis of the helix of each tube being parallel and spaced apart from the axis of an adjacent tube and a plurality of spaced apart connecting elements (6) each interlocking an adjacent pair of capillary tubes.

4,619,318

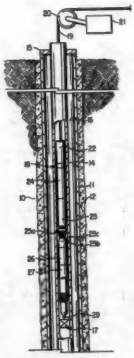
CHEMICAL CUTTING METHOD AND APPARATUS

Jamie B. Terrell, and Donna K. Pratt, both of Fort Worth, Tex., assignors to Gearhart Industries, Inc., Fort Worth, Tex.

Filed Sep. 27, 1984, Ser. No. 655,877

Int. Cl.[4] E21B *29/02*

U.S. Cl. 166—55 **14 Claims**



8. In a downhole chemical fluid jet cutting tool for cutting an object withn a well bore, the combination comprising:

(a) an elongated tool body adapted for insertion into a well-bore,

(b) anchoring means in with said tool body for anchoring said tool at a downhole location in response to the application of fluid pressure and for releasing said tool body in response to the release of said fluid pressure,

(c) a chemical section in said tool body having a chamber therein adapted to contain a source of gaseous chemical cutting agent;

(d) a cutting section in said tool body having a longitudinally extending bore in fluid communication with said chemical

section whereby upon the application of pressure to said chemical section, a chemical cutting agent is forced into said cutting section, said cutting section having at least one cutting port extending from said bore to the exterior of said tool body,

(e) a pressure generating section within said tool body within which pressurized fluid is produced to actuate said anchoring means and to displace said cutting agent into said cutting section, and

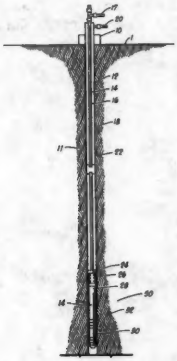
(f) a piston slidably disposed within said chemical section and interposed between said chamber and said pressure generating section to prevent commingling between pressurized fluid in said pressure generating section and chemical cutting agent within said chemical section.

4,619,319

PACKER AND ACTUATION PORTION OF TUBING CONVEYED COMPLETION SYSTEM

Paul D. Ringgenberg, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Feb. 1, 1985, Ser. No. 697,604
Int. Cl.[4] E21B *33/129, 43/116*
U.S. Cl. 166—55.1 **15 Claims**



1. An improved tubing conveyed well perforating system comprising:

a packer assembly portion;

a port assembly portion releasably connected to the packer assembly portion, the port assembly including:

a lower adapter;

an upper mandrel extension having a portion thereof retained within the lower adapter;

an upper extension case releasably secured to the lower adapter;

a middle mandrel extension slidably, sealingly engaging a portion of the upper mandrel extension therein;

a lower extension case releasably secured to the upper extension case; and

a deflecting port adapter assembly releasably secured to the lower extension case, the deflecting port adapter assembly including:

a port adapter releasably secured to the lower extension case having a plurality of ports therein and a bore therethrough;

a deflector having a portion thereof blocking a portion of the bore of the port adapter and having the ends thereof releasably secured to the port adapter; and

a deflector retainer releasably secured to the port adapter releasably retaining the ends of the deflector thereon; and

an actuating assembly portion releasably connected to the port assembly portion, the actuating assembly portion including:

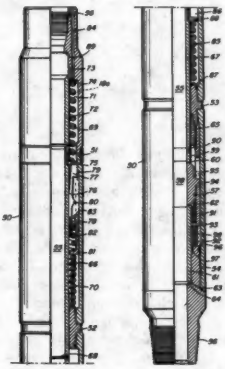
a firing head actuating assembly.

4,619,320

SUBSURFACE WELL SAFETY VALVE AND CONTROL SYSTEM

Dewa N. Adnyana, Stamford, and Neil E. Rogen, Westport, both of Conn., assignors to Memory Metals, Inc., Stamford, Conn.

Filed Mar. 2, 1984, Ser. No. 585,424
Int. Cl.[4] E21B *34/06*
U.S. Cl. 166—65.1 **18 Claims**



1. A subsurface well safety valve apparatus comprising:

means defining an elongate substantially tubular housing adapted at each end for connecting to and communicating with sections of well tubing,

valve means mounted within said housing and therein alternatable between an open condition for enabling fluid conduction through the bore of said tubular housing and a closed condition for blocking fluid conduction therethrough, and

means mounted within said housing for selectively opening and closing said valve means including opposing first and second actuator means, each including a shape memory alloy material which undergoes complementary shape transformations when respectively heated to or above or cooled below a predetermined temperature corresponding to the transition temperature of the shape memory alloy and each having a pair of ends, one end engaging said housing, said means for opening and closing further including means interconnecting the respective other ends of said opposing first and second actuator means and said valve means and being shiftable between a first valve open position and a second valve closed position, and means for heating said first actuator means to or above its predetermined temperature while said second actuator means is cooled below its predetermined temperature for transforming said respective actuators to shift said interconnecting means to its first position to open said valve means and means for heating said second actuator means to or above its predetermined temperature while said first actuator means is cooled to below its predetermined temperature for transforming said respective actuators to shift said interconnecting means to its second position to close said valve means.

4,619,321

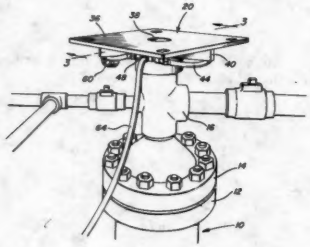
METHOD AND APPARATUS FOR TREATING DOWN HOLE EQUIPMENT FROM CORROSION IN PRODUCTION WELL

John M. Molina, Odessa, Tex., assignor to Jose F. Molina, Odessa, Tex., a part interest

Filed Jun. 17, 1983, Ser. No. 505,483

Int. Cl.[4] E21B *19/00*

U.S. Cl. 166—90 **3 Claims**



1. A corrosion inhibiting chemical applying apparatus for subsurface equipment including rods, tubing, pump and other equipment, either as such equipment is being pulled from a well or when such equipment is being run in the well, said apparatus including an upright tubular nipple for downward threaded mounting from the upper end of a well pumping tee, said nipple defining a vertical passage extending therethrough, an upstanding tubular body of greater inside diameter than the inside diameter of said nipple mounted and projecting upward from the upper end of said nipple, a horizontal top mounting plate secured over the upper end of said body and projecting condiserably outwardly beyond the outer surfaces of said tubular body and having a central opening formed therethrough substantially coaxial with said passage, a plurality of spray heads mounted externally upon and spaced about said tubular body and opening generally radially thereinto intermediate the opposite ends of said body and closely underlying said mounting plate, exterior manifold means communicated with each of said spray heads for supplying fluid under pressure from said manifold means to said spray heads, said manifold means including means for receiving therein anti-corrosive treatment liquids under pressure, said top mounting plate projecting horizontally outwardly of said spray heads and said manifold means, and an upstanding gusset plate secured between undersurface of said top mounting plate and the outer surface of said tubular body below said top mounting plate intermediate each pair of peripherally adjacent spray heads.

4,619,322

CENTRALIZING DEVICES FOR USE DOWN-WELL

Richard A. Armell, and Andrew Scott, both of Montrose, Scotland, assignors to Drexel Equipment (UK) Limited, London, England

Filed Nov. 9, 1984, Ser. No. 669,785

Claims priority, application United Kingdom, Feb. 10, 1984, 8403600; Jul. 17, 1984, 8418211

Int. Cl.[4] E21B *17/10*

U.S. Cl. 166—241 **3 Claims**

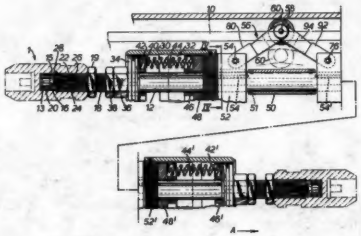
1. A centralizing device for use down-well in maintaining a sensor or other operational tool in a location accurately centralized in relation to the axis of the bore hole, irrespective of the angular orientation of the device and associated tool, said device comprising

an elongate member,

at least three, two-arm, linkages, carried as an array on the elongate member,

two collars mounted on and in axial moving relationship with the elongate member, each arm of each linkage being pivoted to the other arm of that linkage at a location spaced from the elongate member and being pivoted at the other end to a respective one of the two collars,

resilient means, distinct from the arms themselves, acting on the collars whereby to bias the arms angularly towards one another and thereby the common pivot axis of the arms away from the elongate member, and a plurality of



wheels, each mounted for rotation on an axis coincident with the common pivot axis of each pair of arms, these wheels being arranged to contact the inside of a surrounding member within the bore hole and comprising

a self-lubricating bearing bush

a steel core, and

an outer annulus of nitrile.

4,619,323

METHOD FOR CONDUCTING WORKOVER OPERATIONS

John L. Gidley, Houston, Tex., assignor to Exxon Production Research Co., Houston, Tex.

Division of Ser. No. 270,059, Jun. 3, 1981, abandoned. This application Jul. 14, 1983, Ser. No. 513,876

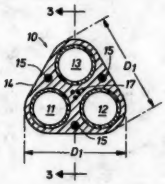
Int. Cl.[4] E21B *33/13, 37/00*

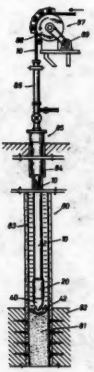
U.S. Cl. 166—285 **12 Claims**

1. A method for conducting workover operations in a well extending from the earth's surface comprising the steps of:

(a) positioning in said well a non-electrically conductive matrix string containing non-pumping tool means for use in conducting workover operations, said matrix string including three conduits of similar size capable of carrying fluids through said matrix string and means capable of conducting electrical power to said tool means from the

earth's surface and means capable of transmitting signals through such string to the earth's surface; and





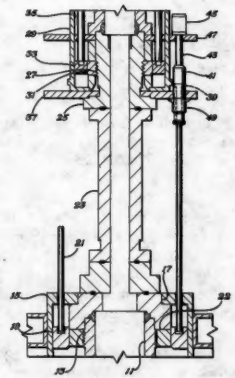
(b) conducting well-treating operations through said tool means by circulating treating fluid down one of said conduits and up a second of said conduits.

4,619,324

WELLHEAD CONNECTOR LOCKING MECHANISM

Donald G. Couch, Ventura, Calif., assignor to Hughes Tool Company, Houston, Tex.

Filed Oct. 15, 1985, Ser. No. 787,203
Int. Cl.[4] E21B *23/00*; F16L *55/00*
U.S. Cl. 166—344 **8 Claims**



7. A method of connecting a coupling to a subsea wellhead body, the coupling being of the type having a plurality of latch dogs carried by the coupling and an actuator ring carried by the coupling for movement between a lower position moving the dogs inward into a latching engagement with the wellhead body, and an upper position freeing the dogs to move outward out of latching engagement with the wellhead body, the method comprising in combination:

mounting a plurality of upright rods to the actuator ring for movement therewith;

providing a running tool with a plurality of engaging members, each for engaging one of the rods;

latching the engaging members to the rods;

lowering the running tool and coupling to the wellhead;

moving the rods downwardly to move the actuator ring to the lower position;

retaining the rods in the lower position; and

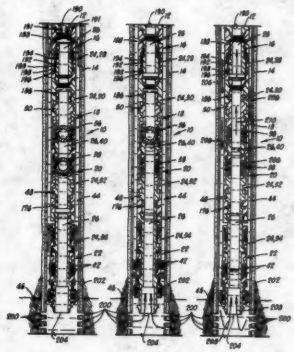
unlatching the engaging members from the rods, and pulling the running tool to the surface, leaving the coupling on the wellhead.

4,619,325

WELL SURGING METHOD AND SYSTEM

Gary D. Zunkel, Chickasha, Okla., assignor to Halliburton Company, Duncan, Okla.

Filed Jan. 29, 1985, Ser. No. 696,240
Int. Cl.[4] E21B *34/10, 37/08*
U.S. Cl. 166—374 **15 Claims**



1. A method of surging a well, said method comprising the steps of:

(a) providing a tool string including upper and lower spaced ball valves and a packer;

(b) initially orienting said tool string so that said ball valves are closed to define a surge chamber therebetween, and so that said packer is in a retracted position;

(c) placing said tool string as initially oriented in step (b) in a well so that said packer is located at an elevation above a zone of said well which is to be surged;

(d) setting said packer to seal a well annulus between said tool string and said well at said elevation above said zone;

(e) after step (d), opening said lower ball valve; and thereby

(f) surging fluid from said zone of said well up through said tool string past said opened lower ball valve and into said surge chamber.

9. A well surging apparatus, comprising:

an elongated housing assembly having a central flow bore disposed therethrough;

upper and lower independently operable ball valves disposed in said housing assembly, each of said ball valves being independently movable between a closed position wherein said flow bore is closed and an open position wherein said flow bore is open, said upper and lower ball valves defining a low pressure surge chamber therebe-

tween when said ball valves are in an initially closed position, said surge chamber being a portion of said flow bore;

packer means, connected to said housing assembly for selectively sealing a well annulus between said housing assembly and a well bore so that a well zone below said packer means may be surged;

lower ball valve operator means for opening said lower ball valve prior to opening of said upper ball valve means, so that well fluid from said well zone may surge upward through said flow bore past said opened lower ball valve into said surge chamber; and

upper ball valve operator means for opening said upper ball valve after said lower ball valve has been opened, and for thereby allowing well fluid in said surge chamber to be circulated upward through a bore of a tubing string connected to said apparatus

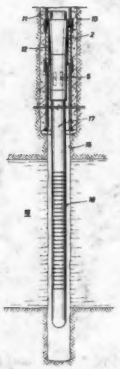
wherein said lower and upper ball valve operator means are each constructed to be actuated in response to an increase in fluid pressure in said well annulus above said packer means relative to fluid pressure within said flow bore.

4,619,326

LINER HANGER WITH BRASS PACKER

Franciscus J. A. van Mierlo, Bakersfield, Calif., assignor to Shell California Production Inc., Houston, Tex.

Filed Apr. 19, 1985, Ser. No. 725,077
Int. Cl.[4] E21B *43/10*
U.S. Cl. 166—382 **4 Claims**



1. In a well completion process in which a casing string is cemented within a well borehole above an oil productive interval, a permeable liner is installed within an extension of the borehole below the casing, an annular seal is installed between the liner and casing, and sand tends to enter the well to an extent tending to cause undesirable erosion of annular seals composed of materials as ductile as lead, an improvement for maintaining the efficiency of the annular seals comprising:

installing within said casing string a section of pipe which has an inner diameter smaller than those of the sections located above it and is positioned near, but above, the oil productive interval;

running the permeable liner to be used into the casing string and borehole extension with the upper end of the liner connected to a liner hanger which contains a tapered sleeve of brass-like metallic material attached around a tubular upper liner hanger element containing axially aligned slots which are penetrated by lugs estending inwardly from a sleeve which is (a) fluid-tightly connected to a tubular lower liner hanger element and (b) arranged to fit snugly, but slidably, over the tubular upper liner hanger element with the clearance between it and the upper tubular liner hanger element, being at least substantially as small as the openings within the permeable liner and said slots and lugs having dimensions arranged to accommodate the extent of vertical travel induced by thermal expansion and contraction of the liner within the well in which it is to be installed; and

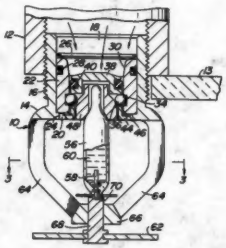
wedging the tapered sleeve of brass-like metallic material into the interior of the pipe string section of reduced diameter by subjecting said sleeve to weight from the liner running string to provide a downwardly directed force sufficient to press it downward into that section and deform the brass-like metallic material into a metal-to-metal seal ring of significant width.

4,619,327

SPRINKLER HEAD

George S. Pieczykolan, North Wales, Pa., assignor to Central Sprinkler Corp., Lansdale, Pa.

Filed Jan. 7, 1985, Ser. No. 689,214
Int. Cl.[4] A62C *37/14*
U.S. Cl. 169—38 **2 Claims**



1. A sprinkler for discharging a fire quenching fluid, comprising a body having a sleeve portion and a flow passage therethrough, a valve member for controlling flow through said passage, said valve member having a plurality of openings facing a groove in said sleeve portion, a plurality of balls at least partially disposed in said openings and in contact with said groove, a bulb of frangible material and containing a heat expansible fluid, a plunger seated on said bulb and disposed so as to urge a portion of each of said balls into said sleeve groove to retain said valve member in a closed position, resilient seal means disposed between a surface of said sleeve portion and said plunger housing and spring means interposed between said sleeve means and said valve member urging it into open position.

4,619,328

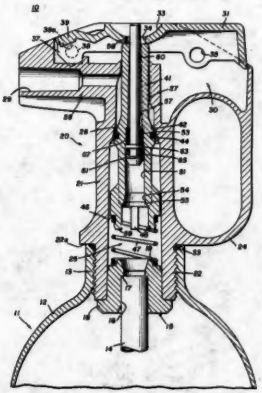
FIRE EXTINGUISHER VALVE WITH PRESSURE INDICATOR

Gerard Seyler, Elgin, and Donald R. Sloan, North Aurora, both of Ill., assignors to Pittway Corporation, Aurora, Ill.

Filed Nov. 28, 1984, Ser. No. 675,630
Int. Cl.[4] A62C *23/08*
U.S. Cl. 169—75 **20 Claims**

1. In a dispensing apparatus for controlling the discharge of material under pressure from a container outlet, including a nozzle and a passageway providing communication between the container outlet and the nozzle, and a valve seat in the passageway, the improvement comprising: an elongated tubular valve stem disposed in the passageway and having an actuating end projecting from the passageway, seal means carried by said valve stem, said valve stem being movable axially of the passageway, bias means disposed in the passageway between the container outlet and the valve seat for resiliently urging said valve stem to a closed condition wherein said seal means is disposed in sealing engagement with the valve seat,

said valve stem being responsive to an external force on said actuating end thereof for movement to an open condition wherein said valve stem and said seal means are spaced from said valve seat, said valve stem having an enlarged-diameter cavity portion therein exposed to the material under pressure, and elongated indicating means shorter than said valve stem



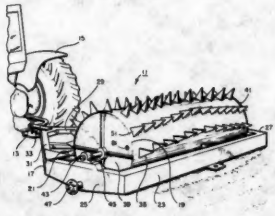
and disposed therewithin for movement axially with respect thereto, said indicating means having an enlarged inner end disposed at all times within said cavity portion of said valve stem and an outer end, said indicating means being responsive to pressure in the container for movement to extended positions with said outer end extending from said actuating end of said valve stem a distance which varies with the pressure.

4,619,329

SOIL AERATOR

Cleon Gorbett, 6224 Indian Creek Dr., Ft. Worth, Tex. 76107

Filed Mar. 12, 1985, Ser. No. 710,998
Int. Cl.[4] A01B *45/02*
U.S. Cl. 172—21 **2 Claims**



1. A soil aerator of the type which increases the surface area of the soil for contact with oxygen without damaging vegetation planted in the soil, comprising:

a towing frame;

a rotatable member mounted on said frame, said rotatable member having an outer cylindrical supporting surface formed along a longitudinal axis of said member, the opposing ends of said member being enclosed by disks to form a drum, said drum being rotatable with respect to said frame about the longitudinal axis of said drum;

a plurality of circumferentially and axially spaced protrusions arranged in rows on said outer cylindrical surface of said drum, each of said rows of protrusions forming a chevron-shaped pattern with respect to a next succeeding row of protrusions, the protrusions in any given row on said outer cylindrical surface being offset along the longitudinal axis of said drum with respect to the protrusions in the next succeeding row, so that the rows of teeth are formed in staggered relationship;

said protrusions being triangular-shaped teeth, each of said teeth having a pair of opposing, planar sidewalls which are separated by a uniform thickness, each opposing sidewall having a base located on the outer cylindrical surface and a pair of sides which converge in an outward radial direction to form an apex, the intersection of each side with said base forming a base angle, each of said base angles being approximately equal; and

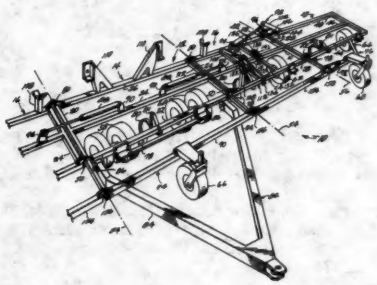
said teeth being arranged on said drum with said sidewalls in a plane generally perpendicular to the longitudinal axis of said drum.

4,619,330

FLEXIBILITY FOR WIDE SWATH AGRICULTURAL IMPLEMENTS

Cecil Machnee, Yorkton, Canada, assignor to Morris Rod-Weeder Co., Ltd., Yorkton, Canada

Filed Mar. 21, 1984, Ser. No. 591,785
Int. Cl.[4] A01B *73/04, 63/22*
U.S. Cl. 172—311 **14 Claims**



1. A flexible frame for wide-swath traveling agricultural implements adapted to follow the contours of the ground and maintain a substantially constant height relative thereto, comprising:

a plurality of frame sections arranged side-by-side relative to travel direction and each adapted to be supported by at least one ground-engaging wheel;

hinge means connecting adjacent of said sections for relative flexing therebetween about an axis substantially parallel to travel direction for following ground contours and for folding of at least one of said adjacent sections relative to the other for non-operational transport of the implement;

at least one of said sections comprising a pair of separate subsections arranged side-by-side relative to travel direction; and

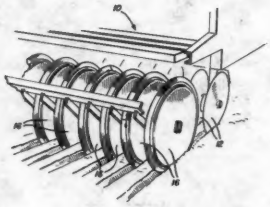
pivot means connecting said subsections to each other for relative flexing between side-by-side portions of said frame about an axis substantially perpendicular to travel direction and located about midway between fore-and-aft ends of said sections with respect to said travel direction, each of said portions being adapted to be supported by at least two wheels spaced apart in the direction of travel, whereby said portions more readily follow ground contours.

4,619,331

PROTECTIVE SURROUND FOR PACKER WHEELS

Gerald T. Johnson, Sr., R.R., P.O. Box 76, Kulm, N. Dak. 58456

Filed Jul. 22, 1985, Ser. No. 757,291
Int. Cl.[4] A01C *7/20, 13/00*
U.S. Cl. 172—518 4 Claims



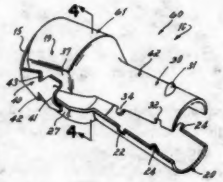
1. A packer wheel for a farm implement comprising a pair of shallow cup-like metal half shell members circumferentially secured together by welding, and circumferential reinforcing means for the wheel comprising a surrounding band of generally right angle-section metal having radially inwardly diverging webs with edge portions engaging outer peripheral surfaces of the respective half shell members to enclose said circumferental weld of said half sheel members and being welded thereto.

4,619,332

CONNECTOR FOR A HELICALLY GROOVED METALLIC CONDUIT

Robert K. Sheehan, 571 Rolling Rock La., Cincinnati, Ohio 45230

Continuation of Ser. No. 595,331, Mar. 29, 1984. This application Jan. 31, 1986, Ser. No. 825,689
Int. Cl.[4] H02G *3/06*
U.S. Cl. 174—65 R 57 Claims



5. A connector for mounting a conductor surrounded by a helically grooved metallic conduit to a junction box having a wall and a hole in said wall through which conductors pass, comprising:

a one-piece sheet metal member;

said member having a center ring and having at least one pair of projections extending rearwardly from said center ring to form a compressible tubular member over which said grooved conduit may be received, said tubular member including detent means for preventing said projections forming said tubular member from collapsing and losing said tubular form during compression; and

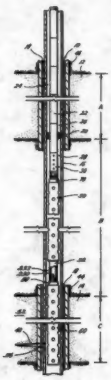
said member also having junction box locking means for resiliently engaging said wall of said junction box when said center ring is inserted through said hole.

4,619,333

DETONATION OF TANDEM GUNS

Flint R. George, Katy, Tex., assignor to Halliburton Company, Duncan, Okla.

Continuation-in-part of Ser. No. 481,074, Mar. 31, 1983, Pat. No. 4,544,034. This application Nov. 18, 1983, Ser. No. 553,440
Int. Cl.[4] E21B *43/117*
U.S. Cl. 175—4.52 29 Claims



1. In a cased wellbore having a pipe string extending downhole through at least one formation and supporting first and second perforating guns, the method of perforating the well comprising:

forming a fluid passageway to the first perforating gun for the pressure actuation thereof;

closing the flowbore of the pipe string to the fluids in the annulus;

establishing a pressure in the flowbore of the pipe string tht is less than the formation pressure;

effecting fluid pressure down the passageway to actuate the first perforating gun;

opening the flowbore of the pipe string to flow from the annulus prior to the actuation of the second perforating gun; and

actuating the second perforating gun.

4,619,334

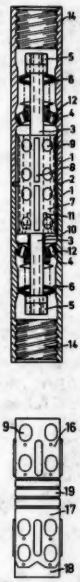
JOINT DEVICE IN EXTENSION DRILL EQUIPMENT FOR PERCUSSIVE DRILLING

Christer Gustafsson, Norberg, Sweden, assignor to Secoroc AB, Fagersta, Sweden

Filed Aug. 28, 1985, Ser. No. 770,165
Claims priority, application Sweden, Sep. 6, 1984, 8404488
Int. Cl.[4] E21B *17/07*
U.S. Cl. 175—321 11 Claims

1. Joint device in extension drill equipment for percussive drilling and arranged in the drill string between a drill machine and a drill bit, said joint device having a pair of interacting impact surfaces therein, and means cooperating with said impact surfaces for transmitting compressive pulses in the drill string above said impact surfaces in the direction towards the

drill bit, said means also being operative by reflection to transform tensile pulses that are present in the drill string below said



impact surfaces, and directed opposite to said compressive pulses, into further compressive pulses.

4,619,335

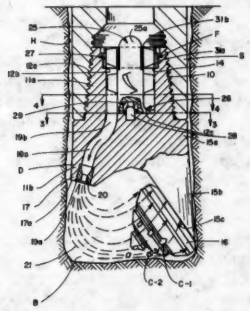
ENHANCED CIRCULATION DRILL BIT

Doyle W. McCullough, P.O. Box 90484, Houston, Tex. 77290

Filed Aug. 16, 1984, Ser. No. 641,577

Int. Cl.[4] E21B *10/18, 10/60*

U.S. Cl. 175—339 **4 Claims**



1. An enhanced circulation drill bit adapted to be mounted at the end of a drill string for enhancing the removal of drill bit cuttings from the bottom of the borehole being drilled, comprising:

a drill body having an upper body section adapted to be attached to a drill string and a lower body section having mounted therewith a plurality of cone-type cutters;

said upper body section having a bore therein adapted to be in fluid communication with the bore of the drill string to receive drilling fluid flowing downwardly through the drill string;

said lower body section having three passageways therethrough, each of said passageways having a first and a second end opening, said passageways being in fluid communication with said bore of said upper body section at said first end opening and said passageways extending through said lower body section to a second end opening;

flow response means mounted in said upper body section bore for intermittently opening and closing said passageways in response to the flow of fluid entering said upper body section bore in order to intermittently deliver concentrated high velocity flow outwardly of said second end of a passageway to the end of the borehole to increase jet impact force and enhance cross circulation and removal of drill bit cuttings;

said flow response means includes rotation means mounted with said upper body section bore for rotating therein in response to fluid entering said bore, said rotation means including a rotor and rotation mount means is mounted with said rotor and with said drill body for mounting said rotor for rotation in said bore of said upper body section;

flow blocking means mounted with said rotation means and rotating therewith for intermittently blocking flow to said passageways as said rotation means rotates, said flow blocking means including a flow blocking element mounted with said rotor and moving circumferentially to intermittently block off flow to one or more of said first ends of said passageways;

flow director means for directing fluid flow against said rotation means to cause rotation thereof, said flow director means mounted with said upper body section in said bore thereof for directing fluid flow against said rotor to cause rotation thereof;

said rotor having vanes mounted thereon, said vanes extending radially outwardly for implementing rotation of said rotor in response to fluid flow;

said flow director means including static vanes;

static vane mount means fixedly attaching said vanes in said upper body section bore upstream of said rotor mounted vanes for directing fluid flow against said rotor mounted vanes;

said rotor is mounted centrally of said upper body section bore, said upper body section bore and said rotor being cylindrical such that an annular flow space is formed therebetween;

said rotor vanes and said static vanes being mounted in said annular space; and

said rotor vanes and said static vanes having opposing inclined surfaces.

4,619,336

METHOD OF AND APPARATUS FOR WEIGHING DOSES OF POWDER

Richard Boyer, Cusset, and Jöel Diquet, Vichy, both of France, assignors to Manufacture de Machines due Haut-Rhin, Mulhouse, France

Filed Apr. 6, 1984, Ser. No. 597,463

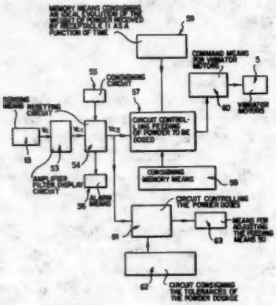
Claims priority, application France, Apr. 18, 1983, 83 06297

Int. Cl.[4] G01G *19/00, 19/52, 13/00, 13/02*

U.S. Cl. 177—1 **11 Claims**

1. Method of dosing a powder by weight, employing a balance **12** provided with a weighing receptacle **11** and with means **13** for continuously measuring the effective weight of the effective contents of the receptacle **11**, and means **4, 5** for positively feeding powder to be dosed toward the weighing receptacle **1**, consisting of means which during a dosing cycle energizes feeding means **4, 5** at an initial instant t_0 at which the receptacle **11** is theoretically empty to a final instant t_2 in which the receptacle **11** has received from the feeding means **4, 5** since the initial instant, a weight of powder of a predetermined value P_2 less than a predetermined final value to be

obtained P_3 of a quantity corresponding (P_3 minus P_2) to an error of powder loss caused by the feeding means **4, 5** to interrupt at such final instant t_2 the functioning of the powder feeding means **4, 5** and to permit thereafter residual powder flow into the receptacle **11** corresponding to the effective amount of the error through powder loss, characterized in that the final instant t_2 has been predetermined with reference to the initial instant t_0 as well as an ideal evolution I of the weight of powder received by the receptacle **11** as a function of time from the initial instant t_0 to the final instant t_2, and that each instant of the operation of the feeding means **4, 5** the effective weight of the powder received by the receptacle **11** since the initial instant t_0 is compared with a theoretical weight which conforms to the ideal evolution I and one continuously controls the operation as a function of the resultant of such comparison, in order to increase the rate of flow of powder if the



effective weight thereof is less than the theoretical weight at the instant considered or to reduce the rate of feeding of the powder if the effective weight thereof is greater than the theoretical weight of the powder at the instant considered, and thus to adapt the evolution II of the effective weight of powder received by the receptacle **11**, when the feeding means **4, 5** are functioning, to achieve an ideal evolution I of the feeding of the powder, predetermining an upper admissible limit and a lower admissible limit around the said predetermined final value P_3 and in that, at the expiration of a predetermined delay sufficient for the flowing into the receptacle **11**, after the final instant t_2, of the residual powder corresponding to the error of powder less during its transmission, one compares the effective weight of powder received by the receptacle **11** to said limits, in order to define a good weight or a bad weight depending upon whether the effective weight is located between said upper and lower limits or outside said limits.

4,619,337

ELECTRIC BALANCE WITH SCALE ON TOP

Lothar Behrend, Gleichen; Jürgen Ober, Hardegsen; Erich Knothe, Bovenden, and Franz-Josef Melcher, Hardegsen, all of Fed. Rep. of Germany, assignors to Sartorius GmbH, Fed. Rep. of Germany

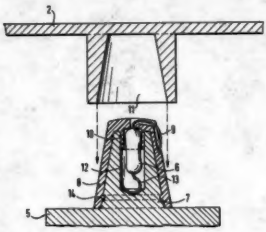
Filed Mar. 26, 1985, Ser. No. 716,082

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1984, 3411550

Int. Cl.[4] **G01G** *3/14, 23/00, 23/10*

U.S. Cl. 177—210 R **9 Claims**

1. Electric balance having a housing and a metallic balance scale which is located over the housing and is supported in a removable manner by at least one pin through at least one perforation in the housing on at least one metallic load receiver of a measuring system, characterized in that an insulating layer (**8, 18, 28, 29**) is located between the metallic balance (**2**) and the metallic load receiver (**5**) insulating the scale from the receiver, the insulation is bridged by a resistor means (**6**) located on the pin (**7, 17, 27**), the resistor means prevents electro-



static charging of the scale while also preventing electromagnetic alternating fields from affecting the balance.

4,619,338

METHOD AND DEVICE FOR CONTROLLING POWER STEERING DEVICE

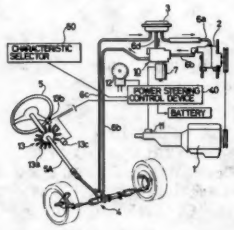
Katsumi Higashi, and Sadao Takeshima, both of Higashimatsuyama, Japan, assignors to Jidosha Kiki Co., Ltd., Tokyo, Japan

Filed Dec. 11, 1984, Ser. No. 680,429

Claims priority, application Japan, Dec. 13, 1983, 58-233679

Int. Cl.[4] **B62D** *5/04*

U.S. Cl. 180—142 **5 Claims**



3. In a system for controlling a power steering device having a flow control valve unit coupled to an oil pump and a power steering unit, means for determining vehicle speed, means for determining steering angular velocity, and control means coupled to said flow control valee unit for controlling the flow rate of supplied by said flow control valve unit to said power steering unit in accordance with vehicle speed, the improvement wherein said control means includes:

means for determining normal oil flow rate for a given vehicle speed;

means for comparing steering angular velocity with a threshold value;

means for comparing the normal oil flow rate with a predetermined minimum oil flow rate when the steering angular velocity exceeds said threshold value; and

supply means for controlling the flow control valve unit to supply oil to the power steering unit at said normal rate when said normal rate exceeds said predetermined minimum rate and for controlling the flow control valve unit to supply oil to the power steering unit at said predetermined minimum rate when said normal rate does not exceed said predetermined minimum rate, said supply means including means for controlling the flow control valve unit to supply oil to the power steering unit at an initial higher flow rate than said predetermined minimum rate for a time period determined by the vehicle speed

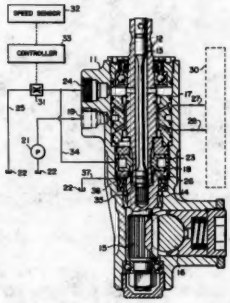
when said normal rate does not exceed said predetermined minimum rate.

4,619,339

FLUID PRESSURE CONTROL DEVICE IN POWER STEERING APPARATUS

Takeshi Futaba, and Masahiko Noguchi, both of Yao, Japan, assignors to Koyo Jidoki Kabushiki Kaisha, Nara, Japan

Filed Nov. 23, 1984, Ser. No. 674,073
Claims priority, application Japan, May 9, 1984, 59-67294[U]
Int. Cl.[4] B62D *5/08*
U.S. Cl. 180—143 **3 Claims**



1. In a power steering apparatus connected to a pump and a cylinder and provided with an input shaft, an output shaft connected with one end of said input shaft, and a control valve rotatable about said input shaft so that fluid under pressure from the pump is selectively supplied to the cylinder upon relative displacement of said control valve to thereby power-assist the rotation of said output shaft to thereby actuate steering wheels of a vehicle, an oil pressure control device comprising:

control means for pressing against the outer circumference of said input shaft;

a throttle valve provided in a return circuit of said fluid from said power steering apparatus to said pump and controlled in accordance with the speed of the vehicle; and

a fluid passage member connected between an inlet of said throttle valve and an inlet of said control means for guiding said fluid controlled by said throttle valve to said control means to thereby cause said conrol means to be pressed against said input shaft.

4,619,340

HIGH CLEARANCE SELF-PROPELLED VEHICLE WITH VARIABLE CLEARANCE AND VARIABLE WHEEL SPACING

Willard O. Elmer, Indianola, Nebr. 69034, and Edgar J. Rickel, 8109 El Monte, Shawnee Mission, Kans. 66208

Filed Jan. 14, 1985, Ser. No. 691,503
Int. Cl.[4] B60P *3/00*
U.S. Cl. 180—209 **25 Claims**

1. In a vehicle, the combination comprising:

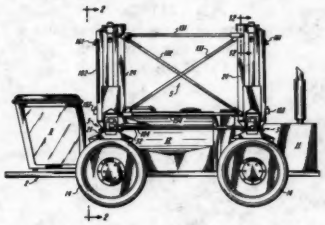
a frame;

a wheel assembly at the front and rear on each side of said frame, each said wheel assembly including a wheel, a yoke mounted on the wheel, and a post extending up from the top of said yoke; and

lateral support means connected between the front wheel assemblies and said frame and connected between the rear wheel assemblies and said frame to suspend said frame between said wheel assemblies,

said lateral support means including an inner portion and a pair of oppositely disposed outer portions for each of said front wheel assemblies and said rear wheel assemblies, each pair of outer portions being movable laterally with respect to the associated inner portion to vary the spacing between opposite wheels,

each said wheel assembly being pivotally connected to an upper outer end portion of an adjacent one of said outer portions at an upper pivot and having a bracing means



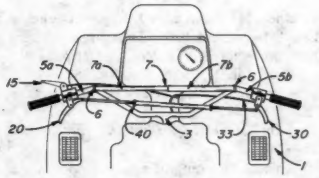
including a pair of variable length bracing members extending from opposite positions on said lateral support means to connect with the yoke of an associated wheel assembly and movable in response to a change in position of said outer portions for holding said wheel assembly substantially vertical each time the spacing between opposite wheels changes.

4,619,341

THROTTLE-GRAB BAR APPARATUS FOR SNOWMOBILES

Vern E. Davis, Box 744, Homedale, Id. 83628

Filed Jun. 6, 1985, Ser. No. 742,012
Int. Cl.[4] B60K *26/00*
U.S. Cl. 180—335 **9 Claims**



7. In combination with a snowmobile having a pair of oppositely disposed handlebars for steering:

a pair of grip-type throttle controls one of said throttle controls mounted on each of said handlebars;

a grab bar extending between said handlebars and affixed thereto; and

a tie rod connecting each of said throttle controls together for operation of the throttle by either hand of the operator.

4,619,342

MULTIPLE SOUND TRANSDUCER SYSTEM UTILIZING AN ACOUSTIC FILTER TO REDUCE DISTORTION

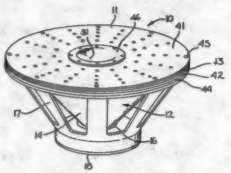
Marshall D. Buck, Los Angeles, Calif., assignor to Cerwin-Vega, Inc., Arleta, Calif.

Continuation-in-part of Ser. No. 291,425, Aug. 10, 1981, abandoned, which is a continuation of Ser. No. 57,821, Jul. 16, 1979, Pat. No. 4,283,606. This application Oct. 12, 1982, Ser. No. 433,829

The portion of the term of this patent subsequent to Aug. 11, 1998, has been disclaimed.

Int. Cl.[4] H04R 7/00, 9/06

U.S. Cl. 181—184 15 Claims



1. An improved multiple source sound transducing system comprising:

first transducing means for providing a first source of low frequency acoustic energy directed towards a listening environment;

second transducing means for providing a second source of high frequency acoustic energy, said second source and said first source having respective acoustic centers acoustically oriented coaxially along an axis oriented towards said listening environment; and

an acoustic filter comprising a baffle member having a higher acoustic impedance at higher acoustic frequencies relative to its impedance at lower acoustic frequencies, said baffle member being acoustically disposed between said first transducing means and said second transducing means and also being acoustically disposed between said first transducing means and said listening environment,

whereby said baffle member will tend to attenuate the higher frequency acoustic energy from said second transducing means as it is propagated towards said first transducing means and to further attenuate that portion of said higher frequency acoustic energy reflected by said first transducing means towards said listening environment.

4,619,343

NOISE-ISOLATED FASTENING OF AN OIL SUMP TO A CRANKCASE

Karl Lengenfelder, Nuremberg, Fed. Rep. of Germany, assignor to M.A.N. Maschinenfabrik Augsburg-Nürnberg Aktiengesellschaft, Nuremberg, Fed. Rep. of Germany

Filed Jul. 23, 1985, Ser. No. 758,169

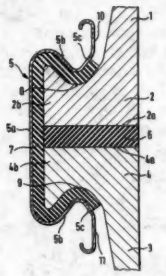
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427529

Int. Cl.[4] F02F 7/00; F16F 15/00

U.S. Cl. 181—208 9 Claims

1. A noise-isolated fastening of an oil sump to a crankcase of an internal combustion engine using an intermediate layer of elastic material; said fastening comprises:

a plurality of specially shaped spring clips which hold said oil sump and crankcase together directly with each other said crankcase being provided with a first shaped connecting flange, and said oil sump being provided with a second shaped connecting flange; in a connected state, said spring clips elastically engage said first and second connecting flanges directly to effect said holding together of said oil sump and said crankcase; soft elastic material is disposed between said spring clips on the one hand, and said first and second connecting flanges on the other hand completely free of any screw fastening otherwise being provided therewith.



4,619,344

COMPOSITE SOUND AND HEAT INSULATING BOARD

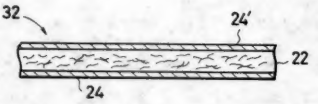
Naomoto Uesugi, Tokyo, and Shoji Suzuki, Aichi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 596,289, Apr. 3, 1984, abandoned. This application Sep. 18, 1985, Ser. No. 777,271

Claims priority, application Japan, Apr. 28, 1983, 58-075464; Apr. 28, 1983, 58-075465

Int. Cl.[4] F02M 35/00

U.S. Cl. 181—229 11 Claims



1. An air cleaner casing including an air cleaner for being operatively connected to an internal combustion engine, said casing being provided on an inner surface with at least one composite sound and heat insulating board comprising a base layer consisting of a compacted mat of filaments, and an additional layer of a plastic material, one surface of the base layer being securely attached to one surface of the additional layer, said plastic material being a relatively soft material having a lower hardness relative to said mat.

4,619,345

FLEXIBLE LUBRICANT APPLICATOR

Mary Rands, 3315 Villa Knolls Dr., Pasadena, Calif. 91107

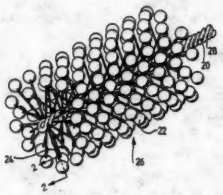
Filed Jan. 22, 1985, Ser. No. 693,583

Int. Cl.[4] F16N 15/00

U.S. Cl. 184—109 10 Claims

1. A flexible lubricant applicator for forcibly applying a desired quantity of a lubricant material to a workpiece surface, harder than the lubricant material, comprising: a lubricant applicator base member provided with outwardly extended and positioned lubricant means and compliant lubricant mounting means flexibly compliantly mounting same relative to the rest of said base member; said base member being provided with movement-transmissible force-applying coupling means cooperable for driven engagement with respect to externally applicable movement-causing means for applying force to said base member when its lubricating means is placed in abradable engagement with a harder surface of a workpiece, said lubricating means being physically softer than the surface of a workpiece adapted to be forcibly mechanically lubricated

thereby through forced abrasion of said softer lubricating means by surface irregularities present in such a workpiece



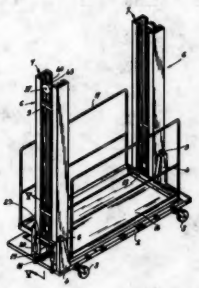
surface; said lubricant means comprising an outer plurality of spaced lubricating globules provided with and being affixed to outer ends of said flexible compliant lubricant mounting means.

4,619,346

ELEVATOR-TYPE WORK PLATFORM

Louis Deguerry, Trevoux, France, assignor to Comabi S.A., Ain, France

Filed Jul. 11, 1984, Ser. No. 629,682
Claims priority, application France, Jul. 11, 1983, 83 11920
Int. Cl.[4] B66B *9/20*
U.S. Cl. 187—9 E **17 Claims**



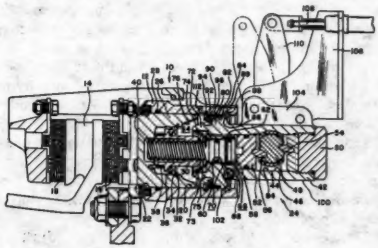
1. An elevator comprising:
a horizontal chassis;
a telescopingly extensible and retractable mast having upper and lower ends and formed of interfitting inner and outer elements having respective upper and lower ends;
a guide extending along the inner element between its ends;
a platform adapted to support a worker and displaceable in the guide along the inner element between its ends;
pivot means securing the lower end of the outer element to the chassis for pivoting of the mast about a pivot axis relative to the chassis but without disconnection therefrom between an erect position with the upper ends above the lower ends and a recumbent position with the mast lying on the chassis and the mast ends generally level with each other, the axis being sufficiently above the chassis that in the recumbent position the platform can lie between the chassis and the mast;
drive means connected between the chassis and the mast for pivoting the mast about the axis from the recumbent to the erect position and thereafter vertically extending the mast and raising the platform; and
latch means on the lower ends of the elements and on the chassis for blocking extension of the mast and displacement of the platform along the guide of the inner element except when the mast is in the erect position.

4,619,347

DISC BRAKE ASSEMBLY

Peter J. Schreiner; Daniel L. Bolenbaugh, and David R. Krebs, all of South Bend, Ind., assignors to Allied Corporation, Morristown, N.J.

Filed Feb. 2, 1984, Ser. No. 576,512
Int. Cl.[4] F16D *55/224*
U.S. Cl. 188—72.6 **10 Claims**



1. Disc brake assembly comprising a rotor, a pair of friction pads supported adjacent said rotor, a caliper for urging said friction pads into braking engagement with said rotor when a brake application is effected, said caliper defining a bore therewithin, a piston slidably mounted in said bore to bias one of said friction pads against said rotor, said piston being mounted in an end of the bore adjacent said one friction pad, the other end of said caliper defining an opening, and a cartridge assembly including a body housing received in said opening, and means securing said body housing in said opening, said body housing cooperating with the said bore and said piston to define a fluid pressure chamber therebetween for receiving fluid pressure during a service brake application, said body housing defining a bore therewithin, and parking brake actuating means mounted in said bore of said body housing, said parking brake actuating means including a force transmitting stem slidably supported in the bore of the body housing and projecting therefrom into the bore of said caliper housing for force transmitting engagement with said piston when a parking brake application is effected, and manually actuated means in said bore of the body housing for urging said force transmitting stem toward said piston, said securing means including a sliding interface between the bore of the caliper and said body housing, sealing means at said sliding interface, a stop on said caliper, said sliding interface permitting relative movement of said body housing with respect to said caliper toward and away from said stop, and resilient means between said caliper and said body housing to bias the latter away from said piston assembly and into engagement with said stop.

4,619,348

COMBINED HYDROPNEUMATIC BRAKE CYLINDER/AIR RESERVOIR DEVICE WITH AUTOMATIC DOUBLE-ACTING SLACK ADJUSTER ARRANGEMENT

Eric G. Smith, Burlington, Canada, assignor to WABCO Ltd., Hamilton, Canada

Filed Apr. 18, 1984, Ser. No. 603,810
Int. Cl.[4] F16D *65/72*
U.S. Cl. 188—351 **8 Claims**

1. A hydropneumatic actuator device comprising:
(a) a pneumatic cylinder;
(b) a dual piston assembly operatively disposed in said pneumatic cylinder for axial movement between a release position and an application position defining a predetermined stroke including:
(i) a positioning piston cooperating with said pneumatic cylinder to form a first chamber on one side of said positioning piston, pressurization of said one chamber

producing a differential force on said positioning piston in the direction of said application position;

(ii) a power piston interconnected with said positioning piston for joint operation therewith, said power piston cooperating with said pneumatic cylinder to form second and third chambers on the opposite sides of said power piston in which compressed air is normally stored in said release position of said dual piston assembly, one of said second and third chambers being vented in said application position of said dual piston assembly to provide a force differential across said power piston in the direction of said application position;

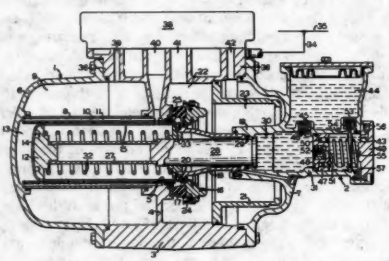
(c) a reservoir in which hydraulic fluid is stored;

(d) a hydraulic cylinder having an inlet via which hydraulic fluid is supplied to said hydraulic cylinder from said reservoir, and an outlet;

(e) a hydraulic piston connected to said dual piston assembly and operably disposed in said hydraulic cylinder to displace hydraulic fluid in accordance with movement of said dual piston assembly between said release and application positions; and

(f) double-acting slack adjuster means for adjusting the amount of hydraulic fluid in said hydraulic cylinder in accordance with overtravel and undertravel of said dual piston assembly to maintain said predetermined stroke thereof constant, said slack adjuster means comprising:

(i) a pair of axially spaced end stops located in said hydraulic cylinder between said inlet and outlet;



(ii) a slack adjuster piston reciprocally disposed in said hydraulic cylinder between said pair of end stops, one side of said slack adjuster piston forming in cooperation with said hydraulic cylinder a reference chamber;

(iii) a first passageway in said slack adjuster piston via which hydraulic fluid in said hydraulic cylinder is connected to said reference chamber;

(iv) a first one-way check valve in said first passageway to prevent flow of hydraulic fluid from said hydraulic cylinder to said reference chamber during movement of said slack adjuster piston from said other end stop into engagement with said one end stop, whereby a predetermined amount of hydraulic fluid is displaced from said reference chamber via said outlet;

(v) a pin projecting from said one end stop into said reference chamber so as to engage and thereby open said first one-way check valve in response to movement of said slack adjuster piston a distance corresponding to said predetermined stroke of said dual piston assembly, whereby an additional amount of hydraulic fluid in excess of said predetermined amount is displaced from said hydraulic cylinder via said first passageway;

(vi) a second one-way check valve in said inlet via which makeup hydraulic fluid is drawn from said reservoir into said hydraulic cylinder in response to movement of said dual piston assembly toward said release position following engagement of said slack adjuster piston with said other end stop to thereby compensate for said overtravel of said dual piston assembly during the preceding movement thereof toward said application position;

(vii) a second passageway between said reservoir and said reference chamber;

(viii) a third one-way check valve in said second passage via which hydraulic fluid in said reference chamber flows into said reservoir when a predetermined back pressure develops at said outlet prior to said slack adjuster piston engaging said one end stop during operation of said dual piston assembly toward said application position to thereby compensate for said undertravel of said dual piston asembly; and

(ix) an annular seal in said reference chamber between said outlet and said second passageway with which said slack adjuster piston is engageable at substantially the same time that said first one-way check valve is opened by said pin on engagement thereof with said one end stop.

4,619,349

VIBRATION ISOLATOR

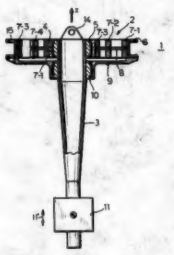
Dieter Braun, Otterfing, Fed. Rep. of Germany, assignor to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung, Munich, Fed. Rep. of Germany

Filed Aug. 2, 1985, Ser. No. 761,956

Claims priority, application Fed. Rep. of Germany, Aug. 4, 1984, 3428820

Int. Cl.[4] F16F 7/10

U.S. Cl. 188—380 **5 Claims**



1. A vibration isolator having two degrees of freedom and operating according to the anti-resonance principle, comprising a pendulum means, a spring arrangement and means connecting said pendulum means to said spring arrangement, said pendulum means including a pendulum rod and a pendulum weight adjustably mounted on a free end of said pendulum rod, said spring arrangement including an inner ring including attachment means for connection to a first body, an outer ring including attachment means for connection to a second body, and a plurality of curved leaf spring elements connected at one leaf spring end to said inner ring and the other leaf spring end to said outer ring, said connecting means including a first spherical pivot bearing operatively arranged between said inner ring and said pendulum rod, and a second spherical pivot bearing operatively arranged between said outer ring and said pendulum rod, whereby an end of said pendulum rod opposite said free end is supported by both said first and second spherical pivot bearings, and wherein said curved leaf spring elements are flexible so as to allow a relative motion between said inner ring and said outer ring perpendicular to a plane extending through both rings, thus in a direction parallel to said pendulum rod.

4,619,350

CLUTCH OPERATION CONTROL SYSTEM FOR FLUID TORQUE CONVERTER OF VEHICULAR TRANSMISSION

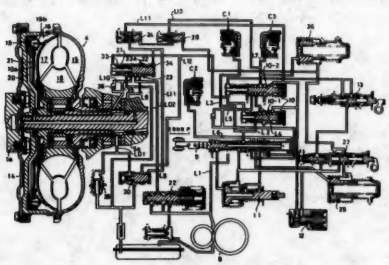
Masakazu Maezono, and Keiichi Ishikawa, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jun. 1, 1984, Ser. No. 616,282

Claims priority, application Japan, Jun. 1, 1983, 58-95774

Int. Cl.[4] F16D *47/06*

U.S. Cl. 192—3.31 **8 Claims**



1. A clutch operation control system for a fluid torque converter, having an input side and an output side, of a vehicular transmission in which a clutch is provided for mechanically connecting the input side and output side of said torque converter and said clutch has its clutch plate supplied at its one side with oil pressure in a control chamber for releasing the clutch and at its other side with the torque converter oil pressure in said fluid torque converter, and in which an oil line leading to said control chamber is connected at a vehicular speed equal to or higher than a predetermined level to an oil drain port by means of a control valve responsing to a vehicular speed so that said clutch may be operated with an engaging force determined by said torque converter pressure and by the drainage from said control chamber wherein said clutch plate is formed with an orifice for providing communication between the two sides of said clutch plate; and said control valve is formed with a throttle portion for throttling the communication passage between said oil line and said drain port in a relatively low vehicular speed range equal to or higher than said predetermined level.

4,619,351

ENGAGEMENT DEVICE FOR AN ELECTROMAGNETIC SPRING-WOUND CLUTCH

Koitabashi Takatoshi, Annaka, Japan, assignor to Sanden Corporation, Gunma, Japan

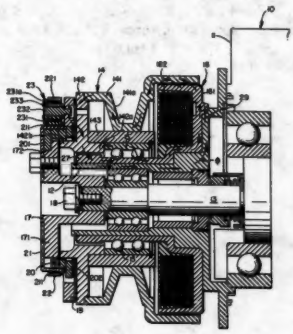
Filed Sep. 5, 1984, Ser. No. 647,383

Claims priority, application Japan, May 9, 1983, 58-137668[U]

Int. Cl.[4] F16D *27/10, 41/20*

U.S. Cl. 192—35 **8 Claims**

1. In an electromagnetic spring-wound clutch including a first rotatable member having an axial end plate of magnetic material, a second rotatable member coaxially positioned with respect to said first rotatable member, an armature plate member coaxially positioned with respect to said first rotatable member and frictionally engageable therewith, a coil-wound spring wound around a portion of said first rotatable member and being connected at its respective ends to said second rotatable member and said armature plate member, a cover plate fixed to said second rotatable member and covering the outer peripheral surface of said coil-wound spring, and electromagnetic means associated with said axial end plate of said first rotatable member for attracting said armature plate member to said xial end plate so that rotation of said first rotatable member is transmitted to said second rotatable member through said armature plate member and said coil-wound spring by the operation of said electromagnetic means, the improvement comprising a guide member disposed on said cover plate and coaxially rotating with said first rotatable member when said clutch is engaged, said armature plate being connected to said guide member by a plurality of connecting members to maintain a predetermined axial air gap between said axial end plate of said first rotatable member and said armature plate, each of said plurality of connecting members including an elastic member, said cover plate having a radial flange portion which prevents axial movement of said guide member and said armature plate.



4,619,352

ONE-WAY CLUTCH

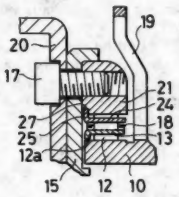
Masao Shoji, Fujisawa; Mikio Uchida, Yamato, and Yoshio Kinoshita, Ayase, all of Japan, assignors to NSK-Warner K. K., Tokyo, Japan

Filed Sep. 10, 1984, Ser. No. 649,177

Claims priority, application Japan, Sep. 27, 1983, 58-148131[U]

Int. Cl.[4] F16D *41/06*

U.S. Cl. 192—41 A **7 Claims**



1. A one-way clutch device comprising:

an inner race;

an outer race disposed radially outside of said inner race and concentric with said inner race;

wedge means tiltably disposed between said inner and outer races for transmitting a torque from one of said races to the other, said wedge means wedge-engaging said races when tilted to connect both races for rotation in unison;

inner and outer retainers concentric with said races for retaining said wedge means between said races and facing said inner and outer races, respectively; and

spring means interposed between said retainers for urging said wedge means toward wedge engagement with said races;

one of said retainers having a radially projecting flange portion extending into a groove provided on the corre-

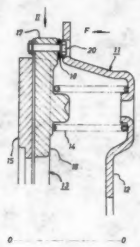
sponding facing race to engage said race and prevent said one retainer from tilting and moving in an axial direction.

4,619,353

CLUTCH COVER ASSEMBLY

Shigeho Maeda, Neyagawa, Japan, assignor to Kabushiki Kaisha Daikin Seisakusho, Osaka, Japan

Filed Feb. 20, 1985, Ser. No. 703,555
Claims priority, application Japan, Feb. 28, 1984, 59-28795[U]
Int. Cl.[4] F16D *13/44*
U.S. Cl. 192—70.18 **3 Claims**



1. A clutch cover assembly comprising:
a clutch cover adapted to be fixed to a flywheel and to cover a rear of a clutch disc;
an annular pressure plate disposed between the clutch cover and the clutch disc;
a forcing means for forcing the pressure plate toward the clutch disc;
a connecting means connecting the pressure plate unrotatably and axially movably to the clutch cover;
releasing means for moving said pressure plate away from the clutch disc toward the clutch cover; and
the pressure plate having
an annular support member positioned adjacent to the clutch cover, connected to the forcing means and having an outer periphery and bosses projecting radially outwardly from that outer periphery,
a pressure member positioned adjacent to the clutch disc for pressing the clutch disc, and having on outer periphery and bosses projecting radially outwardly from that periphery, and
elastic strap plates unrotatably and elastically connecting the bosses of the support member and the bosses of the pressure member, and being positioned beyond the outer peripheries of the support member and the pressure member so that an axial clearance may be formed between both members in the released condition of the clutch disc.

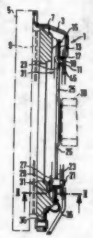
4,619,354

PRESSURE PLATE FOR A MOTOR VEHICLE FRICTION CLUTCH

Günther Rostin, Schweinfurt; Erich Scheer, Prosselsheim; Dieter Kolb, Bad Kissingen, and Karl H. Werner, Schweinfurt, all of Fed. Rep. of Germany, assignors to Fichtel & Sachs AG, Schweinfurt, Fed. Rep. of Germany

Filed Aug. 7, 1984, Ser. No. 638,863
Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329038
Int. Cl.[4] F16D *13/46, 13/71*
U.S. Cl. 192—89 B **16 Claims**

1. In a pressure plate for a motor vehicle friction clutch comprising
(a) a clutch cover,
(b) a presser plate arranged non-rotatably but axially displaceably in relation to the clutch cover,
(c) a diaphragm spring of substantially annular disc form which is provided with radially inwardly protruding spring rongues, said diaphragm spring being supported on the presser plate in the region of its external circumference and on its side axially remote from the presser plate being supported on the clutch cover along a circle radially within the external circumference,
(d) a plurality of securing elements held on the clutch cover and staggered in relation to one another in the circumferential direction of the support circle, said securing elements passing through openings in the diaphragm spring and comprising shoulders facing axially toward the diaphragm spring in the region of the support circle on the side of the presser plate,



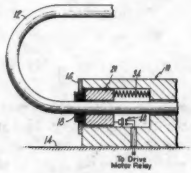
(e) an axially undulatory wire ring substantially following the support circle and being clamped axially resiliently with initial stress between the diaphragm spring and the shoulders of the securing elements, said wire ring having alternating crests and troughs extending in the axial direction of said diaphragm spring, said wire ring including means for securing the wire ring against rotation in the circumferential direction, and said undulatory wire ring being shaped so that it abuts on the shoulders of the securing elements exclusively in the regions of said undulation crests in the unstressed condition in relation to the diaphragm spring.

4,619,355

ESCALATOR HANDRAIL ENTRY SAFETY SWITCH ACTUATOR

Willy Adrian, Obernkirchen, and Ralf Holzhauer, Stadthagen, both of Fed. Rep. of Germany, assignors to Otis Elevator Company, Farmington, Conn.

Filed Aug. 6, 1985, Ser. No. 763,097
Int. Cl.[4] B66B *29/00*
U.S. Cl. 198—323 **2 Claims**



1. An actuator for the handrail entry safety switch in the entry box of an escalator comprising:
two generally U-shaped pieces disposed end-to-end with the bases of the legs of one piece juxtaposed with the bases of the legs of the other piece so as to form a generally cylindrical actuator, the inside of which is sized so as to permit the handrail to pass therethrough and the outside of which is sized and shaped so as to nest within, and be guided longitudinally by the entry box.

4,619,356

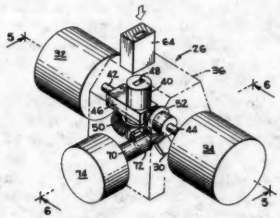
PROGRAMMABLE PARTS FEEDER

Arthur L. Dean, Indiana; William R. Brown; James P. Martin, both of Blairsville; Stanley P. Turcheck, Jr., Ligonier; Junius D. Scott, Homer City, all of Pa., and John D. Gotal, Bristol, R.I., assignors to FMC Corporation, Chicago, Ill.

Filed Aug. 15, 1984, Ser. No. 641,139

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—395 **9 Claims**



6. A reorienter system orienting objects randomly served through a delivery means to said reorienter from a bulk storage means containing said objects comprising:

processor means for inputting, processing and outputting data from and to said reorienter system for controlling said reorienter device;

singulator means interposed in said delivery means for individual object release of objects served to said singulator means from said bulk storage means;

scanning means interposed in said delivery means downstream from said singulator means, said scanning means providing data to said processor means for the determination of a first orientation of said objects; and

reorientor means having a rotor through bore, said rotor supported in a cylindrical housing having at least two access apertures, one aperture being a port aligned with said delivery means and said through bore, said rotor being rotatable in a bearing yoke carried annularly on the exterior of said rotor with said bearing yoke attached to a first stepping motor output shaft, said rotor also being integral with a bevel gear capable of being driven by a second stepping motor having a pinion gear attached to a second stepping motor output shaft, thereby said reorienter means will orient said objects after said objects are delivered to said through bore responsive to processor means after said processor has received data from said scanner means.

4,619,357

PAD TURNING APPARATUS

Edmund Radzins, Sheboygan Falls, Wis., and Timothy J. Kenney, Boynton Beach, Fla., assignors to Curt G. Joa, Inc., Sheboygan Falls, Wis.

Filed Jun. 6, 1985, Ser. No. 742,099

Int. Cl.[4] B65G *47/24*

U.S. Cl. 198—412 **1 Claim**

1. Apparatus for turning oblong pads having major and minor axes, comprising:

an input conveyor for moving a series of pads with their major axes directed along a first line,

an output conveyor for continuing movement of said pads after they have been turned such that their motor axes are directed along a second line generally parallel to the first line,

a planar table disposed between said input and output conveyors,

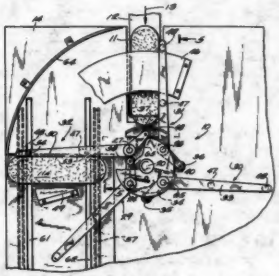
a support member for being driven rotationally about an axis generally perpendicular to the plane of said table,

a plurality of levers mounted to said support member for swinging, respectively, in a plane to which said support member rotational axis is generally perpendicular, said swinging axes of said levers being equiangularly spaced around the rotational axis of said support member and equally radially outward from said rotational axis,

said levers each having on one side of its swinging axis an arm long enough to swing into contact with pads moved in on said input conveyor and the levers having a shorter arm on the other side having cam follower means thereon,

a stationary cam mounted with its profile surrounding the support member axis, said cam follower means being constained to follow said profile as said support member rotates, said profile being configured to cause said levers to contact said pads while the levers are generally parallel to said major axis and to sweep said pads over said table in a curved path to an edge of said table while maintaining the lever generally parallel to said major axis of the pad and directing the minor axis along said second line,

said output conveyor means engaging said pads after they drop from said table and continuing movememnt of said pads along said second line, and



a plurality of shafts journaled for rotation in said support member and having said levers fastened to them for swinging about said axis,

a pre-loaded torsion spring surrounding each shaft and connected to the shaft for applying a torsional force that constrains said cam followers against said cam profile,

a curved guide member extending across said table over the path through which said levers swing between said input and output conveyors, said guide member being spaced from said table for the pads to enter underneath said guide member while the pads are on said input conveyor,

said levers each having prongs projecting toward said table, said prongs being spaced apart along the length of the levers, at least one of said prongs being radially inward of said guide member and another being radially outwardly of sid guide member to engage said pads as said levers sweep over said table between said input and output conveyors.

4,619,358

CONVEYOR ASSEMBLY

Wayne A. May, Sunrise, and Donald J. Peters, Boca Raton, both of Fla., assignors to Jensen Corporation, Fort Lauderdale, Fla.

Filed Nov. 1, 1984, Ser. No. 667,373

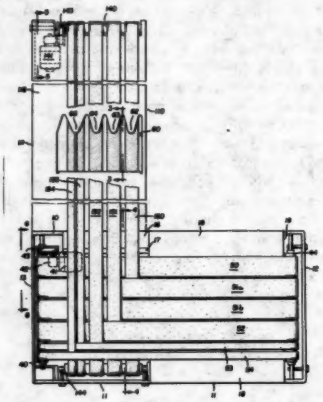
Int. Cl.[4] B65G *47/26*

U.S. Cl. 198—457 **10 Claims**

6. A conveyor having a trailing end and a leading end and comprising a set of elongated, flexible, endless belts having an upper course of travel from said trailing end to said leading end and a return course of travel in the opposite direction below said upper course, the belts being spaced apart in succession laterally and being substantially coplanar in said upper course of travel for conveying an article from said trailing end to said leading end of the conveyor;

a rigid support for said conveyor presenting a substantially flat top piece immediately below said conveyor belts in

said upper course of their travel, said top piece having an opening therein between said trailing and leading ends of the conveyor which extends laterally across the combined



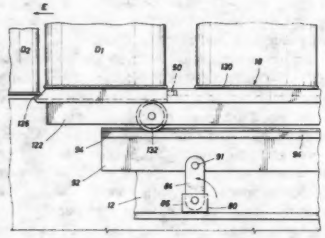
width of said belts, said top piece at the front end of said opening presenting a plurality of laterally spaced teeth which project toward the opposite end of said opening.

4,619,359

MATERIALS HANDLING AND WEIGHING APPARATUS

Conrad P. Kennedy, Jr., Beaumont, and Harry L. Kennedy, Freeport, both of Tex., assignors to Patrick Howard Gibson, Sweeney, Tex.

Filed Jul. 5, 1983, Ser. No. 510,879
Int. Cl.[4] B65G *37/00*
U.S. Cl. 198—463.5 **44 Claims**



1. Materials handling apparatus comprising:

fixed, generally horizontally extending support means having a first support surface, a first end and a second end;

feed in means adjacent said first end of said fixed support means for positioning at least one work piece adjacent said fixed support means, said feed in means being generally horizontally extending;

stop means for engaging said work piece and preventing longitudinal movement of said work piece along said feed in means toward said fixed support means;

movable, generally horizontally extending support means operatively associated with said fixed support means, said movable support means having a substantially planar second support surface, a first end and a second end, said first end of said movable support means being closest to said feed in means, said first end of said movable support means including separating means for separating said work piece abutting said stop means from a second work piece contiguous said work piece abutting said stop means by forcing said second work piece in an upstream direction away from said stop means and said work piece abutting said stop means;

means for moving said movable support means to a first position whereby said second support surface is below said first support surface;

means for moving said movable support means to a second position whereby said second support surface is beneath said work piece when said work piece is in engagement with said stop means;

means for moving said movable support means to a third position whereby said second support surface is above said feed in means, said stop means and said first support surface whereby said work piece is lifted off said feed in means;

means for moving said movable support means to a fourth position away from said feed in means for a distance sufficient to position said work piece above said first support surface; and

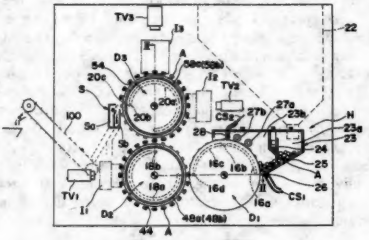
means for moving said movable support means to a fifth position whereby said second support surface is below said first support surface and said work piece is deposited on said first support surface without change in angular orientation.

4,619,360

PRODUCT TRANSPORTING APPARATUS

Shin ichi Taniguchi, Osaka, and Takashi Ohtsuki, Kawabe, both of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 585,582, Mar. 2, 1984, abandoned. This application Jan. 31, 1986, Ser. No. 824,313
Claims priority, application Japan, Mar. 4, 1983, 58-36455
Int. Cl.[4] B65G *47/86*
U.S. Cl. 198—471.1 **2 Claims**



1. A solid drug product transporting apparatus for transporting solid drug products of generally similar shape and/or size successively from a take-in station towards a take-out station, which comprises, in combination:

a support structure;

at least first and second rotary drums mounted by said support structure for rotation in the opposite directions with respect to each other respectively past said take-in station and said take-out station and past each other at a transfer station, each of said first and second rotary drums having on the peripheral surface a plurality of radially outwardly extending tubular receptacles which are arranged in at least one circumferentially extending row in equally spaced relation to each other, some of said receptacles on the first rotary drum being adapted to successively receive a corresponding number of the drug products during each rotation of said first rotary drum for transportation of said drug products, each of said tubular receptacles on said first and second rotary drums being comprised of an inner tube rotatably supported on the associated rotary drum and an outer tube made of an elastic and soft material and mounted tightly on the inner tube and projecting radially

outwardly from the outer periphery of the associated rotary drum and having an inside diameter less than the size of the drug product for supporting the drug product on the outer end thereof, the free end of the outer tube terminating at a location spaced from an opposing outer tube at the transfer station a distance slightly less than the thickness of the drug product being transported such that, when it contacts the corresponding drug product carried by the associated receptacle arriving at the transfer station, the outer tube is axially inwardly compressed a slight distance, whereby the drug product is positively engaged with both engaged outer tubes at the time of transfer so as to prevent a change in its orientation;

means disposed adjacent said first rotary drum at the take-in station for supplying the drug products one by one onto the receptacles on the first rotary drum, said supplying means having in the peripheral surface a plurality of pockets for receiving the drug products therein and which are arranged in at least one circumferentially extending row in equally spaced relation to each other;

a source of compressed air;

a vacuum source;

first means for causing said some of the receptacles on the first rotary drum to be successively communicated with the vacuum source for sucking the respective drug products into said receptacles and also for carrying such drug products until the drug products so carried are transported to the transfer position;

second means for causing said some of the receptacles on the first rotary drum to be successively communicated with the compressed air source for blowing the drug products so transported to the transfer position one by one off the associated receptacles on the first rotary drum;

third means for causing the receptacles on the second drum to be successively communicated with the vacuum source for sucking the respective drug products released from the corresponding receptacles on the first rotary drum into said tubular receptacles and also for carrying such drug products until the drug products so carried are transported to the take-out station; and

fourth means for causing the drug products, which have been successively transported to the take-out station, to be released from the associated receptacles on the second rotary drum onto a subsequent processing station.

4,619,361

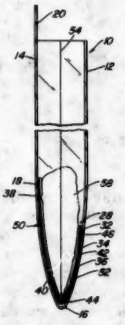
BAG FOR DISPLAYING FOOD

John S. Thomas, Jr., Langhorne, Pa., assignor to Paramount Packaging Corporation, Chalfont, Pa.

Continuation-in-part of Ser. No. 499,586, May 31, 1983. This application Dec. 3, 1984, Ser. No. 677,669

Int. Cl.[4] B65D *81/26, 81/22*

U.S. Cl. 206—204 **11 Claims**



1. A bag for goods adapted to be machine-loaded comprising a front and rear panels of a thermoplastic material, said panels being integral at a fold line to form a closed end of the bag, the bag being open at the other end to facilitate loading of the bag and thereafter closing the open end, pad means for absorbing fluids, said pad means including an absorbent layer between impervious layers of thermoplastic material, said pad means being joined together, said absorbent layer being exposed along an edge of said pad means, said pad means having a fold line juxtaposed to said first mentioned fold line, so that a first portion of the pad means overlays a portion of the front panel and a second portion of the pad means overlays a portion of the rear panel, said first portion of the pad means being welded adjacent an end thereof to said front panel, and said second portion of the pad means being welded adjacent an end thereof to said rear panel.

4,619,362

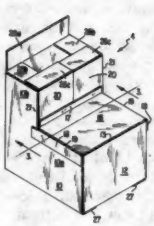
L-SHAPED SHIPPING CONTAINER

Stephen O. Crowe, and Jeffrey D. Harper, both of Springhill, La., assignors to International Paper Company, New York, N.Y.

Filed Oct. 31, 1985, Ser. No. 793,396

Int. Cl.[4] B65D *85/00*

U.S. Cl. 206—326 **8 Claims**



1. A one piece, substantially rectangular paperboard blank for a generally L-shaped carton in which to ship an article of furniture such as a chair, said blank including a plurality of generally rectangular panels and flaps each having an upper edge, a lower edge, and two vertical side edges,

(a) back, left side, lower front and right side panels in the order named from a left end of the blank to a right end, said side panels each having lower and upper parts;

(b) a lower top panel foldably attached at its lower edge to the upper edge of the lower front panel;

(c) lower top panel side flaps each foldably attached at one of its side edges to a respective side edge of said lower top panel;

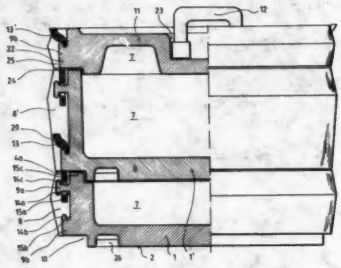
(d) upper front panels each formed from an upper portion of a respective side panel, each upper front panel foldably attached along one of its vertical side edges to an upper part of a respective side panel and further defined by a horizontal slit at its lower edge and by a vertical slit along its other vertical side edge, said horizontal and vertical slits also defining, respectively, the lower and the other side edge of each lower top panel side flap;

(e) upper top forming flaps foldably attached to the upper edges of said back, side and upper front panels.

4,619,363
MULTIPLE TRAY-SHAPED PACKING AND STORAGE UNIT

Alfred Wolfseder, Unterhaching, Fed. Rep. of Germany, assignor to Gregor Hofbauer GmbH, Planegg, Fed. Rep. of Germany

Filed Jan. 29, 1985, Ser. No. 695,876
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407043
Int. Cl.[4] B65D *85/28*
U.S. Cl. 206—373 13 Claims



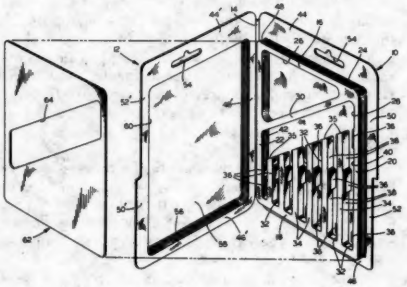
1. A tray-shaped packing container unit, particularly for tools, comprising at least two containers being arranged one above the other, each of said containers having four sidewalls terminating in free upper edges, and a bottom; said sidewalls and said bottom consisting of a shape-retaining material, the downwards facing outer surface of said bottom being formed with a circumferentially extending recess adjacent said sidewalls, the width of said recess corresponding at least to the width of said free upper edges of said sidewalls so as to permit the said edges to be received in the recess of an upper adjacent stacked container, the outer surfaces of at least two opposite sidewalls being formed with locking means engageable by connecting elements, said locking means and said connecting elements being provided with snap engagement elements comprising engagement lugs, each of said at least two opposite sidewalls being provided with at least one first engagement lug disposed adjacent the free edge of said sidewall and facing in a direction towards said bottom, and at least one second engagement lug disposed adjacent said bottom and facing in a direction towards said free edge, and each of said connecting elements being formed as a rectangular plate-shaped connection clamp having a pair of elongated openings in which said lugs are engagable, said snap engagement elements are provided on one side thereof and have projecting leg portions which support said engagement lugs, said first engagement lug of one of said at least two containers being engaged with said second engagement lug of the other of said at least two containers, for connecting said one container to said other packing container arranged one above the other.

4,619,364
DISPLAY PACKAGE FOR DRILL BITS AND THE LIKE

Edmund J. Czopor, Jr., Burlington, Conn., assignor to The Stanley Works, New Britain, Conn.

Filed Sep. 13, 1982, Ser. No. 417,142
Int. Cl.[4] B65D *85/28*
U.S. Cl. 206—379 15 Claims

1. A one-piece case for holding a multiplicity of elongated tool parts comprising: a base component, a closure component, and a connecting hinge component along one side of said base and closure components, said base, closure and hinge components being integrally thermoformed from sheeting of synthetic resinous material; said base component including a peripheral flange portion and an upstanding pedestal portion therewithin, said pedestal portion having a multiplicity of upstanding peripheral ribs of generally inverted U-shaped configuration defining an upwardly opening cavity therewithin and a peripheral sidewall element extending thereabout, said pedestal portion also having a multiplicity of upstanding internal rib formations dividing said cavity into a multiplicity of elongated tool-receiving recesses, at least a majority of said internal ribs being in parallel spaced relationship to define parallel extending tool-receiving recesses, said peripheral flange portion extending about the lower, outer edge of said sidewall element; said closure component being povitable about said integral hinge component between a closed position

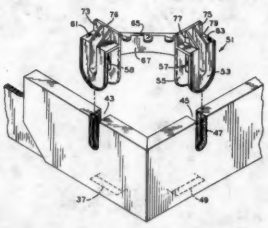


overlying said base component and an open position displaced therefrom, said closure component having a cover element for overlying said cavity of said base component, a peripheral sidewall element depending therefrom, and a peripheral flange portion about the lower edge of said sidewall element; said pedestal portion of said base component seating within the cavity of said closure component in said closed position of said case, with said cover element overlying said cavity of said base component, said flange portions thereof in face-to-face surface contact, and with said respective sidewall elements thereof in frictional interengagement.

4,619,365
BOX AND FASTENER FOR STACKING

Dean A. Kelly, Angola, and Strother H. Brann, Indianapolis, both of Ind., assignors to Alca Enterprises, Inc., Ashley, Ind.

Filed Dec. 6, 1984, Ser. No. 678,655
Int. Cl.[4] B65D *21/02, 6/24*
U.S. Cl. 206—503 7 Claims



1. In an open-faced tray of generally rectangular configuration formed by selectively folding a flat corrugated paper blank and having, when selectively folded, a bottom portion and vertical walls with corner holders near the open face, the improvement wherein the corner holders each comprise inner and outer flanges lying closely adjacent corresponding inner and outer tray sidewall portions and connected by an intermediate portion disposed in a tray sidewall slot and having a "U" shape in the plane of the sidewall, each corner holder including a plurality of relatively rigid upstanding lugs each having a

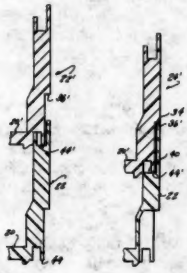
relatively flat upstanding blade extending upwardly, as an extension of the inner flange, beyond the tray open face, each corner holder including reinforcing gussets extending generally normal to said blade flat surface, the gussets being formed as upward extensions of the opposte "U" portion sides, and a cooperating plurality of openings in a tray surface bottom wall opposite the open face whereby a number of such trays may be stacked one upon the other with adjacent trays in the stack having the lugs of one received in the openings of the other with a flat surface of each said flat upstanding blades being adapted to abut an inside surface of a vertical wall of the superjacent tray to substantially limit lateral movement between the trays.

4,619,366

TWO-LEVEL STACKING CONTAINER

Elsmer W. Kreeger, Howell, Mich., assignor to Pinckney Molded Plastics, Inc., Howell, Mich.

Filed Oct. 28, 1985, Ser. No. 791,926
Int. Cl.[4] B65D *21/04*
U.S. Cl. 206—507 **2 Claims**



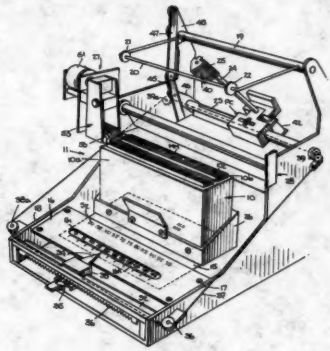
1. A multi-level stacking container comprising a square bottom, a pair of like first sidewalls projecting upwardly respectively from two opposed sides of said bottom, a pair of like second sidewalls projecting upwardly respectively from the other two opposed sides of said bottom, all of said sidewalls being of the same height, each of said sidewalls comprising an inner web joined along its lower edge to said bottom along one side thereof and projecting upwardly from said bottom to a horizontal upper edge, an outer web offset outwardly from said inner web, said outer web having a horizontal upper edge and a horizontal lower edge at substantially the same elevation as the upper edge of said inner web, a central stacking web integrally joined to and disposed between said inner and outer webs, said stacking web having a top edge of upwardly facing alternate horizontal upper and lower edge sections lying respectively at first and second distances below the upper edge of said outer web and a bottom edge of downwardly facing alternate horizontal upper and lower edge sections lying respectively at first and second distances below the upper edge of said inner web, the upper and lower edge sections of said top edge being respectively coextensive with the lower and upper edge sections of said bottom edge longitudinally of said wall and said upper and lower edge sections being symmetrically arranged relative to an imaginary vertical line located midway between the opposite ends of the sidewall, said first sidewalls each having an upper edge section of its top edge located midway between the ends of the walls and said second sidewalls each having a lower edge section of its top edge located midway between the ends of the walls.

4,619,367

AUTOMATIC CARD SELECTOR FOR RANDOM-ACCESS CARD FILE SYSTEM

Isidore Dorman, Whitestone, N.Y., assignor to NB Jackets de Puerto Rico, Cagua, P.R.

Filed Nov. 30, 1984, Ser. No. 676,926
Int. Cl.[4] B07C *5/36*
U.S. Cl. 209—608 **9 Claims**



1. A random-access card file system provided with cartridges each storing at least one deck of cards, each card including an upstanding tab whose longitudinal position corresponds to a particular point on an incremental scale running the full length of the deck, and a card selector for extracting any desired card from the deck regardless of its stored location in the cartridge, said selector comprising:

(A) a carriage movable along a horizontal path above the cartridge which houses a deck that includes a card to be selected, to a point in the path in line with the tab on said card;

(B) a crane supported on the carriage and having a card picker thereon;

(C) operating means which when actuated cause the crane to complete an operating cycle in the course of which it bows down over the cartridge to enable the picker to engage and clamp onto the tab on said card and to then lift the card by its tab to withdrawn it from the cartridge; and

(D) separator means disposed just above the cartridge to assume an operative position relative to said deck as said picker lifts the selected card by its tab to intercept non-selected cards sticking on to the selected card to prevent the picker in the course of lifting the selected card from also withdrawing non-selected cards; said separator means being constituted by a pair of card separators just above the cartridge to straddle the upper corners of the card deck, each separator having a row of gaps therein whose width is slightly greater than the thickness of the upper margin of the card so that the gap is capable of passing only a single card therethrough, each gap having an entry defined by converging walls, the entry having a longitudinal axis which is parallel to the plane of the card, whereby when the selected card is lifted above the deck by the picker and adjacent cards sticking to the selected card are also lifted, as the picker rises, it draws the upper corners of the selected card through the entry nearest thereto for passage through the gap associated therewith, the other cards being intercepted by at least one wall of the entry to be dislodged from the selected card; said separators including a clamped stack of flat blades each having a nose provided with opposing faces and a base, said faces being formed with a step portion to reduce the thickness of the nose to define said gaps, said base being triangulated to define the converging entry walls.

4,619,368

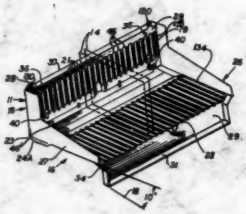
PC BOARD RACK

Charles E. Kappelt, Jr., Linesville, Pa., assignor to Molded Fiber Glass Company, Linesville, Pa.

Filed Jul. 25, 1985, Ser. No. 758,890

Int. Cl.[4] A47F 7/00

U.S. Cl. 211—41 27 Claims



1. A rack unit for plate like members comprising a first support wall and a second support wall disposed generally at right angles to each other,

connecting means integrally connecting said walls together,

a plurality of laterally spaced longitudinally extending first grooves formed in said first wall on the side adjacent said second wall,

a plurality of laterally spaced longitudinally extending second grooves in said second wall on the side thereof adjacent said first wall,

each said second groove being aligned with one of said first grooves whereby a side edge of a plate like member may be received in a said first groove and an end edge of said plate like member received in a said second groove,

a first plate like leg connected to said first support wall at the end thereof remote from said second support wall and extending therefrom in a direction opposite said first wall and generally parallel to said second wall,

a second plate like leg connected to said second support wall at the end thereof remote from said first support wall and extending therefrom in a direction opposite said second support wall and generally parallel to said first support wall,

first foot means being integrally attached to said first leg at the end of said first leg opposite said second support wall and extending from said first leg in a direction from said second wall,

second foot means integrally attached to said second leg at the end of said second leg opposite said first support wall and extending from said second leg in a direction from said first wall,

said rack section being adapted to be supported on a flat surface by said foot means and said connecting means connecting said walls together,

said first leg extending substantially further from said first support wall than said second leg extends from said second support wall providing a substantial grip space to receive the hand of an operator between said first support wall and a supporting surface on which said first foot and said recess bottom parts rest.

4,619,369

SUPPORT OR STABILIZER DEVICES FOR MOBILE CONSTRUCTION EQUIPMENT

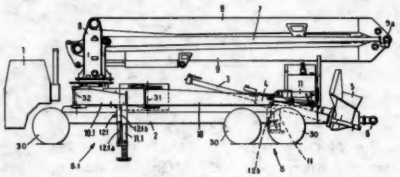
Heinz Mertens, Hamm, Fed. Rep. of Germany, assignor to Maschinenfabrik Walter Scheele GmbH & Co. KG, Unna-Massen, Fed. Rep. of Germany

Filed Mar. 12, 1985, Ser. No. 710,857

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1984, 3409476

Int. Cl.[4] B66C 15/00

U.S. Cl. 212—189 7 Claims



1. A mobile boom-type construction machine comprising:

a base frame, said base frame being provided with wheels for travel of said machine;

a plurality of support legs connected to said frame with each one of said plurality of support legs being telescopically extensible with reference to the respective longitudinal and central axis thereof, and being adapted to extend in a downwardly directed attitude from said base frame at least one of said support legs being formed with a holding bore;

means for mounting each of said support legs to said frame such that it can be moved from an erect first position in which it serves to stabilize the frame for a particular operating function of the machine, into a substantially horizontal second position in which it is at rest and substantially clear of the ground and during which the machine can be driven to a different location;

for each one of said plurality of support legs at least one piston-cylinder unit to effect said movement from said first position to said second position;

for at least one support leg, an extensible carrier arm swingably mounted on said base frame and having a fixed opening for receiving a respective lock member; means for pivotally mounting said carrier arm such that the associated support leg can be swung with respect to said base frame;

a first means for pivotally connected the associated support leg to said carrier arm, said first means forming a first point of reference, and said first means allowing turning movements of the associated support leg with respect to said first point, and wherein said associated support leg is telescopically extensible in length with reference to said first point along its longitudinal central axis;

a second means for pivotally connecting the respective piston-cylinder unit to said carrier arm said second means forming a second point of reference, and said second means allowing turning movements of said piston-cylinder unit with respect to said second point, whereby said first point and said second point are spaced from each other by a fixed distance;

at least one connector for connecting it and the respective free piston end at a third point of reference which is remote from said first point but located on said longitudinal and central axis of said piston-cylinder unit, whereby an actuation of said piston-cylinder unit said connector is adapted to move said at least one support leg between its rest position and its operating position, said connector being secured to the respective support leg in such a way as to be capable of being moved with said associated support leg during a respective telescoping extension movement thereof;

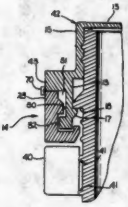
a connecting plate secured to the pivotally mounted support leg at least near said second point, said connecting plate having an opening which is in alignment with said opening of said carrier arm at least when said support leg is in its operating position; and

a lock pin insertable in said opening of said connecting plate and in said opening of said carrier arm for connecting said connecting plate to said carrier arm and for preventing swinging movement of said piston cylinder unit with respect to said first point, but allowing a precise alignment and guiding of said support leg, said lock pin being removable from said openings of said connecting plate and carrier arm for releasing said plate to allow respective swinging movements of said support leg and said piston-cylinder unit with respect to said first point and said second point as aforesaid on actuation of said piston-cylinder unit, said lock pin being adapted to be inserted into said fixed opening of said support leg for preventing the telescoping extension thereof.

4,619,370
TAMPER RESISTANT AND TAMPER EVIDENT CLOSURES

Albert J. Agbay, Worcester, Mass., and Ralph H. Thomas, Sr., Clark, N.J., assignors to Robert Linkletter Associates, Ltd., Union, N.J.

Division of Ser. No. 591,541, Mar. 20, 1984, Pat. No. 4,519,514. This application Feb. 20, 1985, Ser. No. 703,334
Int. Cl.[4] B65D *55/02*
U.S. Cl. 215—225 **6 Claims**



1. A safety closure for a container having a rim defining a mouth, a neck located below said rim, and a peripheral lip around said rim, said closure comprising:

a snap cap having a top overlying said mouth and said rim and having a depending annular flange projecting below said top, said flange having an inwardly directed circumferential bead engaged below said lip, and a first outwardly directed circumferential bead located below said top and cooperating therewith to define a circumferential locking groove extending around the outer side of said flange;

a rotary safety ring having an annular sidewall surrounding said flange and overlying said locking groove and said first outwardly directed circumferential bead, said annular sidewall being closely spaced to said locking groove and said first outwardly directed circumferential bead so that said inwardly directed bead is held in engagement with said lip and prevents removal of said cap;

a plurality of angularly spaced fingers on the inner side of said sidewall projecting into said locking groove and overlying the bottom wall of said locking groove to prevent downward movement of said ring along said cap, said fingers being inclined inwardly and downwardly into said locking groove and having free inner ends positioned to be wedged against the bottom of the locking groove to prevent free flexing of the fingers as the ring is pulled downwardly relative to the cap, thereby normally preventing downward movement of said ring out of overlying relation with said locking groove;

a plurality of longitudinally extending release grooves in said first outwardly directed circumferential bead, spaced and sized to permit movement of said fingers through said first outwardly directed circumferential bead in one angular position of said ring about said cap, and thus allowing downward movement of said ring away from said cap for the removal of the latter from the container in said one angular position; and

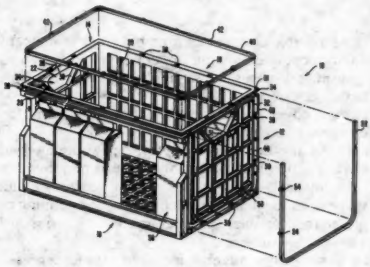
at least one tear pin being attached to said cap and to said ring, said pin being constructed so that it may be broken and being attached so that said closure cannot be opened without breaking said pin,

whereby said closure cannot be opened without breaking said pin.

4,619,371
THREE-SIDED, STACKABLE MATERIAL HANDLING CRATE

James B. Rehrig, 6533 Via Lorenzo, Palos Verdes Peninsula, Calif. 90274

Filed May 14, 1984, Ser. No. 609,649
Int. Cl.[4] B65D *6/34*
U.S. Cl. 220—71 **12 Claims**



1. In a stackable material handling crate having a bottom wall, and an upstanding front wall, back wall, and side walls fixed to said bottom wall, said crate botton wall and said side walls being integrally formed molded plastic panels, an open top opposite said bottom wall defined by the upper edges of said side walls, front wall and back wall, an opening in said front wall through which material in the crate can be removed, and means reinforcing said crate, the improvement wherein said reinforcing means comprises:

a first circumferential channel extending around the periphery of said crate adjacent said open top said first channel having a substantially U-shaped cross-section defined by a top wall, a back wall, and a bottom wall so that the open side of said first channel faces outwardly, one of said first channel walls having first retaining means for retaining a first reinforcing member therein;

a first circumferential reinforcing member extending around and closely engaging the periphery of said crate adjacent said open top, said first reinforcing member fitting within said first channel and retained within said first channel by said first retaining means;

a second substantially U-shaped channel having a substantially U-shaped cross-section extending around and closely engaging the periphery of each of opposite walls of the crate, said U-shaped second channel opening upwardly and extending through the bottom wall of said first channel so that said second channel connects with said first channel at a connecting position, said second channel having a second retaining means for retaining a second reinforcing member therein; and

a second substantially U-shaped reinforcing member fitting within and coextensive with said second channel and retained within said second channel by said second retaining means, said second reinforcing member being integrally connected to said first reinforcing member, at said

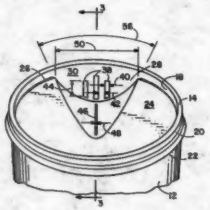
connecting position where said second channel connects with said first channel.

4,619,372

CAP FOR HOT BEVERAGE CUP

Joseph R. McFarland, 507 Palo Alto Dr., Vancouver, Wash. 98661

Filed Apr. 21, 1986, Ser. No. 854,389
Int. Cl.[4] A47G *19/22*; B65D *5/64*
U.S. Cl. 220—90.4 13 Claims



1. A detachable closure cap for a beverage container having a circular opening defining a lip, comprising:

(a) peripheral means for sealingly engaging the lip of said beverage container;

(b) a main cover portion generally horizontally disposed and circumscribed by said peripheral means;

(c) means for defining a depression adjoining said main cover portion and located within said peripheral means;

(d) downwardly-extending outer wall means, included in said means for defining a depression, for defining one side of a narrow annular space alongside an interior surface of a beverage container;

(e) a sloping floor member included in said depression and extending diagonally upward from a lower portion of said outer wall means to said main cover portion;

(f) means for defining a plurality of apertures extending through said outer wall means; and

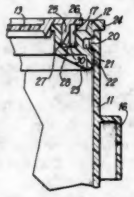
(g) means for defining a slit through said floor means, said slit extending along said floor means generally radially of the portion of said closure cap defined within said peripheral means and located between said outer wall means and said main cover portion.

4,619,373

PLASTIC PAINT CONTAINER

Herbert W. Galer, 24 Woodland Trail, Newna, Ga. 30263

Filed Oct. 4, 1985, Ser. No. 784,549
Int. Cl.[4] B65D *43/06*
U.S. Cl. 220—354 13 Claims



1. A resealable plastic container assembly comprising:

a generally cylindrical plastic container having a bottom end, an upward extending sidewall, an open top and at least one annular rib on its inner circumference near its top;

a plastic ring, having at least one annular recess on its outer circumference complementary to the ribs of said container fitted within the inner circumference of the rim of the open top end of said container, said ribs and said recesses mated in interlocking relationship between said container rim and said ring to provide a permanent and continuous leakproof seal between said container and said ring, said ring further comprising a channel along the inner periphery thereof opening upward with respect to the bottom of said container; and

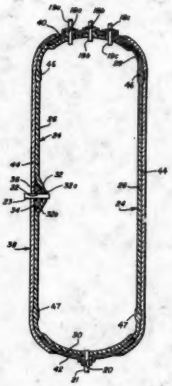
a lid for removable attachment with said ring comprising a substantially flat disk having a downwardly extending flange at the periphery of said disk adapted to fit within the channel of said ring and to provide a tight leakproof seal between said top and said ring, and further comprising a lip extension beyond said flange around the periphery of said lid at the top of said flange, for prying open said lid from said ring and container.

4,619,374

PRESSURE VESSEL WITH AN IMPROVED SIDEWALL STRUCTURE

William M. Yavorsky, Woodbury, Minn., assignor to Ecodyne Corporation, Chicago, Ill.

Continuation of Ser. No. 612,239, May 21, 1984, abandoned, and a continuation-in-part of Ser. No. 447,769, Jan. 24, 1983, abandoned. This application Jan. 24, 1986, Ser. No. 822,921
Int. Cl.[4] B65D *25/02, 25/34*; F16J *12/00*
U.S. Cl. 220—414 4 Claims



1. A pressure vessel for containing fluids, said pressure vessel comprising a thin thermoplastic inner liner forming a container which is impervious to said fluids, said container having a substantially cylindrical middle portion, a substantially hemispherical first end portion and a substantially hemispherical second end portion, said end portions being connected with said cylindrical middle portion, a segment of said cylindrical middle portion of said thin inner liner disposed inward to define at least one recess in said container, the wall of said recess being substantially the same thickness as said cylindrical middle portion of said thin inner liner, said recess having a depth which extends from the outer surface of said container to the bottom of said recess and which is substantially greater than the wall thickness of said cylindrical middle portion of said thin inner liner; an insert means positioned within and substantially filling said recess and adhered to the walls of said recess for forming a thickened section, said thickened section being an integral part of said thin inner liner and having a maximum thickness substantially greater than the wall thickness of said cylindrical middle portion of said thin inner liner, the outer surface of said thickened section being substantially contiguous with the outer surface of said cylindrical middle portion and forming a substantially smooth curved surface

with said cylindrical middle portion; a thin outer filament wound liner bound to and covering a substantial portion of said inner liner and covering said insert means, for providing added strength and forming a rigid, integral vessel with said inner liner and insert means; and a port extending through a segment of said outer liner and said insert means and said segment of said inner liner for providing access to the interior of said vessel; said segment of said outer liner, said insert means and said segment of said inner liner forming a localized area of increased wall thickness for said vessel sufficient to support a fitting and form a leakproof seal along said port.

4,619,375

SHEET DISPENSER

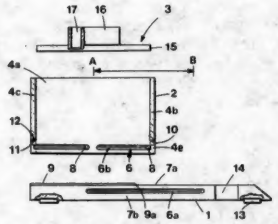
Franz Kathari, 5, chemin des Coquelicots, 1214 Vernier, Switzerland

Filed Feb. 22, 1985, Ser. No. 704,529

Claims priority, application Switzerland, Feb. 22, 1984, 852/84

Int. Cl.⁴ A24F *15/04*; G07F *11/46*

U.S. Cl. 221—186 **3 Claims**



1. Device for scratch pads intended to place the bottom sheet of a stack of rectangular sheets of a predetermined thickness on a writing surface for note taking comprising: a carriage mounted to slide on a support, said carriage comprising vertical walls designed to contain the stack of sheets, the device including guiding means intended to guide the movements of the carriage on the support in a feed direction from a first stop position to a second stop position, said support consisting of a plate exhibiting an upper surface comprising a plane first and second portion, the bottom sheet of said stack resting on said first portion when said carriage is in said first stop position and on said second portion when said carriage is in said second position, said first portion being located at a higher level than said second portion, a step having a height approximately equal to said predetermined thickness separating said first and second portions, said carriage having a front wall whose lower edge is separated from the surface of said second portion by a gap considerably greater than said sheet thickness but less than twice this thickness, so that the bottom sheet of said stack upon engaging said step, is separated from the stack and goes through an opening formed by this gap, when said carriage is moved from said second position to said first position, and rests on said plane second portion intended to serve as a flat writing surface, said first and second stop positions being laterally offset from one another by such a distance that a sheet disposed in said second position is partially beneath and engaged by said stack of sheets that is in said first position so that the sheet in said second position has a part of its surface pressed against the underlying support.

4,619,376

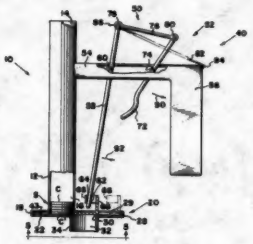
BINGO CHIP DISPENSER

Clifford A. Huss, 1766 Hull Rd., Twining, Mich. 48766

Filed Feb. 8, 1985, Ser. No. 699,562

Int. Cl.⁴ B65G *59/00*; B65H *3/00*; B65D *5/72*

U.S. Cl. 221—243 **2 Claims**



1. Chip dispensing apparatus comprising:

an upstanding, elongate, chip receiving chute for receiving and storing a stack of chips to be dispensed including;

an upper opening for receiving chips; and

a lower opening through which chips may pass;

means for individually dispensing the lowermost chip in said stack of chips comprising:

slide means, having a chip receiving aperture therethrough, for receiving and laterally transferring the lowermost chip of said stack of chips;

means mounting said slide means for to-and-fro reciprocal movement between a chip receiving portion in which said chip receiving aperture is aligned with said lower opening and a laterally removed chip releasing position in which a chip received by said aperture is allowed to downwardly descend through said aperture while the balance of the stack is held in said chute by said slide means;

means for reciprocally moving said slide means between said chip receivng chip releasing positions comprising;

hand graspable handle means for supporting said chute means comprising a pistol grip handle including a horizontal handle portion mounted on said chute and a vertically disposed hand receiving terminal portion;

lever means swingably mounted on horizontal handle portion between said chute and said vertically disposed hand receiving terminal portion and having a lower end portion for coupling to said slide means,

finger actuable trigger means swingably mounted on said horizontal handle portion of handle means between said lever means and said vertically disposed portion and being coupled to said lever means to swing said lever means from an inoperative position in which said slide means is in said chip receiving position and an operating position in which said slide means is in said chip discharging position; and

means for retracting said trigger means from said operative position to said inoperative position;

downwardly depending guide means for receiving the released chip from said slide means and guiding it in a downward path of travel;

lost motion connection means coupling said lower end portion of said lever means to said slide means including a ring mounted on said slide means said ring including an aperture therethrough receiving said lower end portion of said lever means;

said aperture having a cross-sectional area substantially larger than the horizontal cross-sectional area of said lower end portion of the lever means received thereby.

4,619,377

TAP

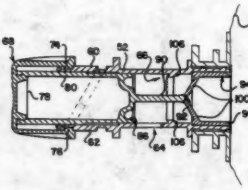
Paul F. Roos, 'Taurus', May Street, Claremont, Cape Town, Cape Province, South Africa

Filed Mar. 28, 1984, Ser. No. 594,251

Claims priority, application South Africa, Mar. 30, 1983, 83/2300; Oct. 28, 1983, 83/8070

Int. Cl.[4] B67B *7/24*

U.S. Cl. 222—83 6 Claims



1. A tap comprising a cylindrical barrel and a cylindrical plunger which is movable along the barrel internally thereof, the barrel having an internal seat, a port in the wall thereof which port serves as an outlet from the barrel, and an inlet thereto, said inlet and port being on opposite sides of said seat, and the plunger being displaceable along the barrel between a first position in which a sealing surface thereof is in engagement with said seat to close said inlet off from said port, and a position in which said sealing surface is spaced from said seat to permit flow from said inlet to said port, said plunger having an edge which, as the plunger is displaced between said positions, moves across said port from a position on one side of said port to a position on the other side of said port, a piercing element in said barrel for piercing a liquid containing pouch to open the pouch, a member forming part of said plunger and which initially protrudes into said piercing element, said piercing element having a part which is initially held in an inoperative position by said member and which moves to an operative position in the path of return movement of said member upon the plunger first being displaced to cause said sealing surface to move away from the seat.

4,619,378

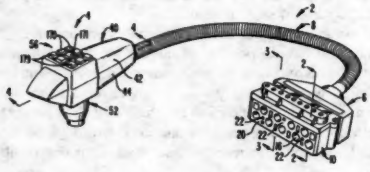
BEVERAGE DISPENSING APPARATUS

Heiko T. de Man, 7157 Hansen Dr., Dublin, Calif. 94568

Filed Nov. 8, 1984, Ser. No. 670,461

Int. Cl.[4] B67D *5/60*

U.S. Cl. 222—144.5 22 Claims



1. A beverage dispensing head of the type for use with a pressurized source of soda and a number of syrups comprising:

a housing;

first, second and third valve blocks secured to one another and mounted within said housing;

said first block including a plurality of first and second openings, said first openings extending into said first block from a first face of said first block, said second openings extending into said first block from a second face of said first block, said first and second openings being transverse to one another, said first and second openings sized and positioned to intersect one another at chosen locations;

said second block having a third face mounted adjacent said second face of said first block and having a fourth face on the side of said second block opposite said third face, said second block including a plurality of third openings extending into said second block from said third and fourth faces;

said third block having fifth and sixth faces on opposite sides thereof and a plurality of fourth openings extending into said third block from said fifth and sixth faces;

syrup spool valve stems and a soda spool valve stem, said syrup and soda spool valve stems each having a cylindrical valve seat surface;

said second, third and fourth openings defining syrup and soda valve stem bores for reciprocally housing said syrup and soda valve stems therein for movement between extended and retracted positions;

valve seats positioned along said valve stem bores against which said valve seat surfaces press when respective syrup and soda valve stems are in retracted positions to close said valve stem bores;

means for biasing said syrup valve stems toward said retracted positions;

said syrup and soda valve stem bores including syrup and soda entry and exit chambers, said entry chambers positioned on one side of said valve seats and said exit chambers positioned on the other side of said valve seats; and

means for fluidly connecting said syrup and soda exit chambers to a discharge opening.

4,619,379

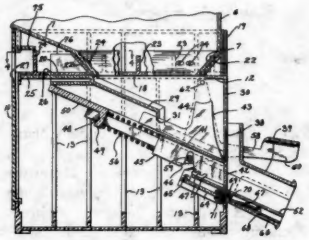
BULK FOOD DISPENSER

Roy J. Biehl, 1133 N. Water St., Milwaukee, Wis. 53202

Filed Aug. 30, 1984, Ser. No. 646,650

Int. Cl.[4] B67D *5/32*

U.S. Cl. 222—153 12 Claims



12. A dispenser for dispensing bulk food, comprising:

a food-receiving hopper having an inlet at its top and an outlet at its bottom, said hopper including a pair of opposite upright side walls, a bottom wall interconnecting said side walls, said bottom wall being inclined downwardly toward said outlet, a front wall removably mounted on said side walls, and an outwardly projecting mounting flange disposed at the upper edges of said side walls;

a housing having a support flange engaging the mounting flange of said hopper to support said hopper;

an adjustable gate slidably mounted between a first position closing off said outlet and a second position opening said outlet to regulate the discharge of food by gravity therethrough, said gate includes a rod-receiving notch formed therein, and a planar plate member; and

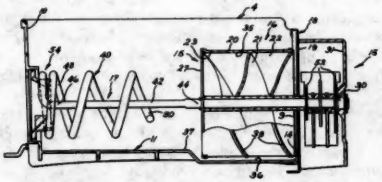
actuator means for moving said gate between said positions, said actuator means includes a handle projecting from said housing having a pair of integral spaced apart side members each pivotally mounted to one of the side walls of said hopper and a rod interconnecting said side members spaced downwardly from said pivot connections and receivable within said notch in said gate.

4,619,380

ICE DISPENSER FOR A HOUSEHOLD REFRIGERATOR

Robert B. Brooks, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Jul. 13, 1984, Ser. No. 630,866
Int. Cl.[4] B65G *33/00*; F25C *5/18*
U.S. Cl. 222—240 7 Claims



1. An ice piece dispenser comprising:

a receptacle for storing ice pieces and having a front discharge opening therein;

dispensing means supported in said receptacle and including:

a cylindrical, rotatable feed section having the outer end thereof positioned adjacent said discharge opening and the inner end thereof having an opening to receive ice pieces and spanned by a metal member which is secured thereto,

a rotatable wire auger comprising an elongate axial portion secured to the cylindrical rotatable feed section at one end and at the opposite end to a helically coiled portion that is radially spaced from and surrounds a major section of the elongated axial portion and extends therealong in a direction toward the feed section, said helically coiled portion having a free terminal end and being unconnected to the elongated axial portion of the auger throughout the length it extends along the elongated axial portion and the free terminal end is spaced from the feed section a distance sufficient to allow small clusters of ice pieces formed around the helical coil to drop off the terminal end and small enough that large clumps of ice pieces are subjected to a crushing action between the terminal end and the metal member of the feed section; and

drive means to rotate the feed section and auger.

4,619,381

METHOD AND APPARATUS FOR DISCHARGING MATERIALS FROM A STORAGE BIN

William O. Wurtz, Paramus, N.J., assignor to Willow Technology, Inc., Paramus, N.J.

Filed Dec. 6, 1984, Ser. No. 678,893
Int. Cl.[4] G01F *11/00*
U.S. Cl. 222—272 15 Claims

1. A storage bin discharge apparatus for discharging difficult-to-handle materials from a storage bin, comprising:

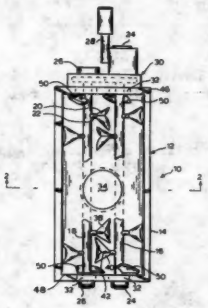
(a) a container adapted to be attached to the bottom of a storage bin which contains difficult-to-handle materials;

(b) two parallel, horizontally spaced apart shafts disposed longitudinally and rotatably mounted in said container;

(c) means for rotating said shafts oppositely to one another in said container;

(d) a discharge opening in said container disposed along the longitudinal direction of said shafts; and

(e) a plurality of working tools mounted on said shafts, each tool comprising two substantially triangularly shaped sides having bottom edges, said sides converging toward each other at their connection to the shaft and converging toward each other to define a forward edge in the direction of rotation of said tool thereby defining a double wedge shape, and a bottom face which is recessed from the bottom edges of said sides, said tools being mounted to said shafts so that the paths of travel of the tools of one shaft come into proximity to the other shaft so as to create an overlapping zone of interaction between the respective tools of said shafts, one side of each tool being disposed at an angle to a plane perpendicular to a plane which includes the axis of said shafts which angle is greater than



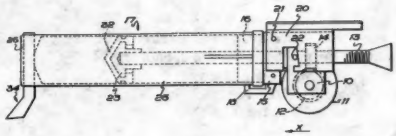
the corresponding angle of the other side of said tool, the angle of said one side being no greater than the angle which moves the optimum amount of material, said tools being arranged on said shafts so that said one side of each tool is arranged in the direction of said discharge opening.

4,619,382

DISPENSERS FOR FLOWABLE COMPOSITIONS

Kenneth Houlbrook, Huddersfield, and Paul A. Thornton, Barnsley, both of England, assignors to Clantex Limited, W. York, England

Division of Ser. No. 574,046, Jan. 26, 1984, Pat. No. 4,508,245.
This application Dec. 21, 1984, Ser. No. 685,231
Claims priority, application United Kingdom, Feb. 24, 1981, 8105793
Int. Cl.[4] B65D *88/54*
U.S. Cl. 222—327 8 Claims



1. A cartridge apparatus for the application of viscous crease-setting composition to creases of garments comprising

(a) an elongated and disposable cartridge body for containing a quantity of the crease-setting composition;

(b) a cartridge body outlet at one end of the body,

(c) means adapting the cartridge body to be connected at the other end to a dispensing mechanism to enable the composition to be discharged from said body outlet,

(d) a nozzle tube supporting body at said one end of the cartridge body,

(e) a bore in the nozzle tube supporting body communicationg with said outlet and lying transverse to the cartridge body;

(f) a rigid hollow nozzle tube sealingly push-fitted in the supporting body bore with an end projecting therefrom;

(g) an inlet in the wall of the nozzle tube communicating with said outlet so that composition discharged therethrough passes into the entrance of the nozzle tube through the tube wall;

(h) a nozzle outlet slot at an end of the nozzle tube projecting from the body, said nozzle outlet slot receiving composition from the rotation of the nozzle tube and being an

elongated narrow slot extending in the direction of the cartridge body; and

(i) means preventing any turning of the nozzle tube relative to the supporting body which could block communication between said outlet and said outlet on the wall of the nozzle and could alter the angle of the nozzle slot relative to the cartridge body.

4,619,383

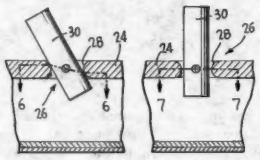
AUTOMATIC DOOR-ACTIVATED AIR FRESHENER

Tim R. Konicek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Division of Ser. No. 655,173, Sep. 27, 1984. This application Dec. 12, 1985, Ser. No. 794,813

Int. Cl.[4] B65D *47/04*; B67D *3/00*

U.S. Cl. 222—556 **2 Claims**



1. A motion-actuated liquid dispensing valve comprising a valve passage of greater length than width, a valve member positioned in said valve passage and pivotally mounted on a pivot having an axis in the direction of said width, said valve member having a major portion of the weight thereof positioned above said pivot whereby said valve member normally assumes a tilted position, said valve member and said valve passages being of related cross-sections such that when said valve member is in a tilted position said valve member fills and closes said valve passage and when said valve member is upright there is clearance in said valve passage around said valve member for limited liquid flow through said valve passage, said valve passage is formed in a bottom wall of a liquid reservoir.

4,619,384

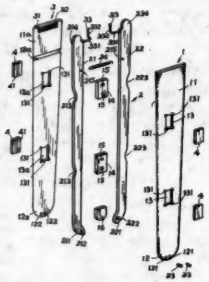
PRINTING OR DRAWING MOLD FOR STOCKINGS

Chia-Shih Chu, and Chin-Lung Wu, both of 4 Fl., No. 7, Lane 89, Chang-Soon St., Taipei, Taiwan

Filed Oct. 15, 1985, Ser. No. 787,733

Int. Cl.[4] D06C *5/00*

U.S. Cl. 223—77 **3 Claims**



1. A printing mold for a stocking comprising:

a main mold including a pair of outer jacket plates each formed as a lengthy tapered plate having a lower arched portion and formed with at least a pair of openings adapted for the insertion of two removable form beds therein;

an extendible mold including a pair of side plates secured by a restoring spring and each side plate having a lower portion pivotedly fixed on said main mold by a screw; a width adjuster for causing said side plates to pivot whereby a stocking fitted over said main mold can be expanded or stretched for a printing operation including a positioning rack having teeth transversely formed on said rack formed on an upper portion of one said outer jacket plates and a pair of locking bars each located on an inner side of an upper portion of each of said side plates so that they face each other, each locking bar adjustably engaged with the teeth of said rack;

at least a pair of printing beds, each having a ferrous metal plate fixed on an inner surface of said bed and inserted within each of the openings formed on at least one of said outer jacket plates of said main mold;

at least one magnetic block located between each of said two beds and having magnets fixed thereon to be attracted by said printing beds having the ferrous metal plate fixed thereon, the thickness of said block defining a separating distance between said two outer jacket plates; and a lower partition block inserted between said two outer jacket plates and having a thickness equal to the said separating distance.

4,619,385

PANTS RACK

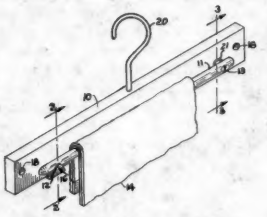
Roy W. Lessard, 19453 Kinai Rd., Apple Valley, Calif. 92307

Filed Feb. 18, 1982, Ser. No. 350,075

The portion of the term of this patent subsequent to Jul. 2, 2000, has been disclaimed.

Int. Cl.[4] A47J *51/14*

U.S. Cl. 223—96 **1 Claim**



1. A pants hanger comprising:

a base support member, rectangular in cross section,

a longitudinal pants holding member, round in cross section, pivotally mounted at one end of said holding member and securely anchored to the base support member,

a wedge bracket anchored to said base support member and located to engage the free end of said pivoting longitudinal holding member, and thereby forcing said longitudinal member to move towards said base support member thereby locking pants draped over said holding member,

a canted hinge pin which accurately controls the pivoting motion of said longitudinal holding member in relation to said base support member and said wedge bracket, such controlled motion producing a large pants loading gap when said longitudinal member is pivoted up and a minimum gap when said longitudinal member is pivoted down,

a friction spacer located at said hinge pin which acts as a hold open device for said pivoting longitudinal holding member thereby optimizing operation,

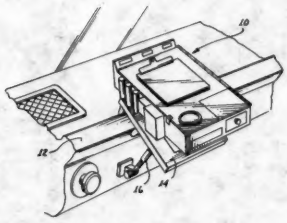
a hook for supporting said base support member by a hanger assembly and mounting holes within said base support member capable of permanently fastening the pants hanger to a wall.

4,619,386

VEHICLE DESK CONTAINER

Jennings R. Richardson, 49 S. Cholla, Gilbert, Ariz. 85234

Filed May 9, 1984, Ser. No. 608,399
Int. Cl.[4] B60R 7/00
U.S. Cl. 224—277 7 Claims



1. A vehicle desk container for use in a vehicle, comprising:

body means for holding a variety of objects and devices;

lid means pivotably coupled to said body mean for opening and closing the top portion of said body means;

built-in compartment means operably coupled to said body means for providing a variety of useful functions, said built-in compartment means having at least one of an electric functional unit, an electronic functional unit any a mechanical functional unit; and

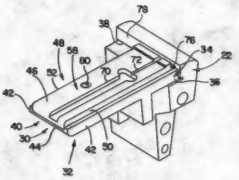
securing means for removably securing said body means to at least one of a seat and a support in said vehicle, said securing means comprises a plurality of straps operably coupled to said body means, each of said calculator, pencil sharpener, clock, light and counter is one of an electric unit, an electronic unit and a mechanical unit, said lid means is pivotably coupled to said body means by hinges, said lid means having a latch allowing said lid means to be snapped shut, said lid means having a spring clip attached to the top side of said lid means for holding papers and other documents, said lid means having an aperture through it for holding cups, glasses and other containers, said lid means having a smaller lid pivotably coupled to said body means by hinges, said smaller lid having a latch allowing said smaller lid to be snapped shut, said lid means having a surface on its bottom side allowing written and other information to be placed thereon, said body means being generally rectangular-shaped container having a bottom, a front end, a rear end and two sides, said body means having a wedge-shaped member attached to the top of said rear end, said wedge-shaped member having a counter, light and clock building into it, said built-in compartment means comprises a drawer which slidably engages said body means, a calculator which slidably engages said body means, a calculator operably coupled to said body means, and pencil sharpener operably coupled to said body means, said front end having apertures through it for engaging said drawer and said calculator and for inserting a pencil into said pencil sharpener, said securing means comprises a plurality of straps operably coupled to said body means, said body means having a plurality of partitions operably attached to the inside of said body means dividing the space inside said body means into a plurality of compartments, said lid means is pivotably coupled to said body means by hinges, said lid means having a latch allowing said lid means to be snapped shut, having a spring clip attached to the top side of said lid means for holding papers and other documents, having an aperture through said lid means for holding cups, glasses and other containers, having a surface on the bottom side of said lid means allowing written and other information to be placed thereon, and having a smaller lid pivotably coupled to said body means by hinges, said smaller lid having a latch allowing said smaller lid to be snapped shut, said base means comprises a flat rectangular-shaped base, said base being removably coupled to the bottom of said body means, support arm means pivotably coupled to said base for supporting said base, a support strut pivotably coupled to said base, and block means operably coupled to said base for removably securing said base to said vehicle dashboard, said body means having a plurality of elongated grooves in its bottom surface for operably engaging said support strut, said block means comprises a fixed block secured to the bottom of said base, an adjustable block slidably engaged to the bottom of said base and a positioning block removably coupled to the bottom of said base, said positioning block having a plurality of bolts engaging it and passing through it for holding said adjusting block against said vehicle dashboard.

4,619,387

FIBER OPTIC CLEAVING TOOL

Jeffrey B. Shank, Williamsport, and Timmy D. Troutman, Lock Haven, both of Pa., assignors to GTE Products Corporation, Stamford, Conn.

Filed Sep. 16, 1985, Ser. No. 776,249
Int. Cl.[4] C03B 37/16
U.S. Cl. 225—96.5 5 Claims



1. In a fiber optic cleaving tool having a pair of pivoted handles operable to actuate two spaced apart pairs of clamping members and a cutting blade, said cutting blade being movable along an axis toward an optical fiber carrying anvil, the improvement comprising: an elongated cleaver base pad fixedly attached at one end to said anvil, said cleaver base pad having alignment means formed thereon; and a fiber guide pad removably positioned on said cleaver base pad, said fiber guide pad being precisely located by means thereon cooperating with said alignment means, said fiber guide pad having a groove therein for receiving an optical fiber.

4,619,388

AUTOMATIC PAPER SHEET SUPPLYING APPARATUS

Yoshiaki Ono, and Katsuhiko Kawaguchi, both of Shizuoka, Japan, assignors to Tokyo Electric Co., Ltd., Tokyo, Japan

Filed Mar. 5, 1985, Ser. No. 708,286
Claims priority, application Japan, Mar. 9, 1984, 59-44889
Int. Cl.[4] B65H 20/20
U.S. Cl. 226—76 8 Claims

1. An automatic paper sheet supplying apparatus to be used in combination with a paper sheet processing apparatus having rotational force generating means, comprising:

a pair of side plates mounted on said paper sheet processing apparatus;

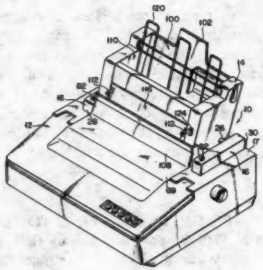
a plurality of connecting bars connecting said pair of side plates;

an automatic long paper sheet supplying apparatus which is mounted on at least one of said pair of side plates and receives a rotational force from said rotational force generating means of said paper sheet processing apparatus so as to supply a long paper sheet to said paper sheet processing apparatus;

output transmitting means, arranged in said automatic long paper sheet supplying apparatus, for receiving the rota-

tional force from said rotational force generating means of said paper sheet processing apparatus; and

an automatic basic-sized paper sheet supplying apparatus, detachably mounted on said plurality of connecting bars to be supported thereby, for receiving the rotational force



from said rotational force generating means of said paper sheet processing apparatus through said output transmitting means so as to supply basic-sized paper sheets to said paper sheet processing apparatus when said automatic basic-sized paper sheet supplying apparatus is mounted on said plurality of connecting bars.

4,619,389

PAPER TRACTOR

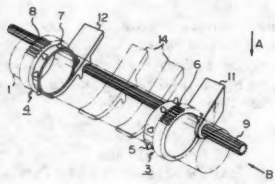
Minoru Isobe, Tokyo, Japan, assignor to Oki Electric Industry Co., Ltd., Tokyo, Japan

Filed May 1, 1985, Ser. No. 729,349

Claims priority, application Japan, May 2, 1984, 59-87836

Int. Cl.⁴ B65H *20/22*

U.S. Cl. 226—79 **6 Claims**



1. A paper tractor device for a printer, for feeding continuous print paper having feed holes on opposite sides thereof, comprising:

(a) a longitudinally extending cylindrical platen, rotatable for winding the print paper therearound;

(b) a pair of ring pin tractors each composed of a ring-shaped wheel slidably mounted on the outer periphery of said platen so as to be longitudinally movable thereon, and having a plurality of sprocket pins engageable in the feed holes in the print paper, each of said ring pin tractors including a tractor gear integral with said ring-shaped wheel;

(c) drive means for rotating said platen, and rotating said ring pin tractors through said tractor gears in the same direction at the same speed as said platen; and

a pair of holders holding said ring pin tractors, slidably mounted on said drive means and coupled to said ring pin tractors for longitudinal movement with said ring pin tractors.

4,619,390

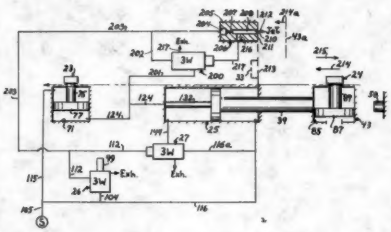
PNEUMATIC FEEDER FOR PUNCH PRESSES

Albert W. Scribner, 6 Country Club Rd., Darien, Conn. 06820

Continuation of Ser. No. 604,031, Apr. 26, 1984. This application Aug. 9, 1985, Ser. No. 763,777

Int. Cl.⁴ B65H *20/18*

U.S. Cl. 226—162 **7 Claims**



1. In a pneumatic feeder for intermittently advancing stock into the work station of a punch press or the like, and having a frame;

feed slide means mounted on said frame for reciprocating movement in index and stock feed directions;

actuating means for actuating said feed slide means in said index and feed directions;

stock gripping means carried by said feed slide means and adapted to be moved between stock releasing and stock gripping conditions;

fluid motor means for actuating said stock gripping means; and

control means for controlling the operation of said actuating means and fluid motor means whereby said stock may be intermittently gripped and advanced in said feed direction, said control means including a primary air valve having an output line for normally controlling the operation of said fluid motor means;

the improvement comprising

a piloted supplementary air valve having a first operative condition for normally permitting said primary air valve to control said fluid motor means, and a second operative condition for overrriding the said normal control of said fluid motor means by said primary air valve and for controlling said fluid motor means so as to cause said stock gripping means to be moved to a stock releasing condition independent of, and without controlling, the operation of said actuating means for said feed slide means;

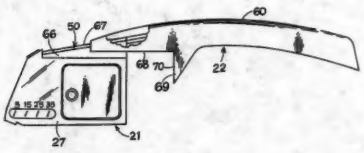
air jet means adapted to issue a jet of air for sensing the arrival of said feed slide means at the terminal portion of a feed stroke of said feed slide means, and for generating an output signal when said arrival in sensed, said air jet means comprising a nozzle and means defining a signal output line, said air jet means being adapted to generate an air output signal for controlling said supplementary air valve; and

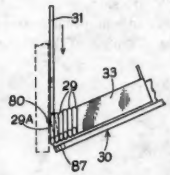
fluid operated means responsive to an output signal from said air jet means for shifting said supplementary air valve from its said first operative condition to its said second operative condition when said air jet means senses the completion of a stock feed stroke of said feed slide means for causing said fluid motor means to operate so as to permit said stock gripping means to move to a stock releasing condition shortly after completion of said stock feed stroke and without causing the initiation of an index stroke of said feed slide means.

4,619,391
SURGICAL STAPLING INSTRUMENT

Edward J. Sharkany, Huntington, and Richard J. Mathews, Sr., Stratford, both of Conn., assignors to Acme United Corporation, Fairfield, Conn.

Filed Apr. 18, 1984, Ser. No. 601,574
Int. Cl.[4] A61B *17/00*
U.S. Cl. 227—19 **22 Claims**





1. A surgical stapling instrument comprising:
A. a housing incorporating
   a. a staple supporting channel member mounted therein,
   b. a plurality of staples slidingly supported on the channel member for spring biased advancement therealong,
   c. a staple forming plate
      1. positioned for cooperative, forming engagement of the lead staple of the plurality of staples, and
      2. responsive to an actuation force for movement between a first, unactuated position and a second, staple engaging and forming position;
B. an actuating handle
   a. pivotally connected to the housing, and
   b. drivingly engaged with the staple forming plate for controlled movement thereof in response to the application of an actuation force; and
C. a support handle slidingly, interlockingly engaged with the housing for secured, mated, locked interconnection therewith,

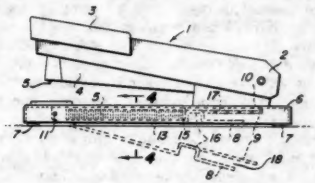
whereby separate materials can be employed for the housing and the handles while the entire assembly can be securely, interlockingly, matingly assembled quickly and easily.

4,619,392
STAPLER WITH STAPLE STORAGE AREA IN BASE

Duk S. Won, 42 Kennedy Dr., West Haverstraw, N.Y. 10993

Filed Mar. 22, 1985, Ser. No. 715,030
Int. Cl.[4] B25C *5/02, 5/11*
U.S. Cl. 227—120 **8 Claims**

1. A stapler comprising
an upper base member,
a lower base member, said lower base member containing a chamber,
a base plate member pivotally attached to one end of the lower base member, said base plate member being adapted to close in said chamber and divide it into two storage areas, and means for holding said base plate member in a closed position so that said chamber can house a supply of staples and

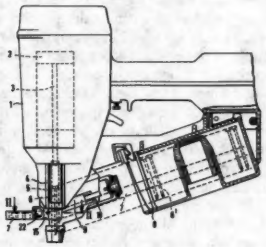


paper clips, said holding means being magnetic pads disposed in said chamber.

4,619,393
DRIVING APPARATUS WITH NAIL STRIP CUTTER

Werner Maurer, Nuertingen, Fed. Rep. of Germany, assignor to Karl M. Reich Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed Jun. 12, 1985, Ser. No. 744,124
Claims priority, application Fed. Rep. of Germany, Jun. 27, 1984, 3423578
Int. Cl.[4] B25C *7/00*; B25F *7/13*
U.S. Cl. 227—136 **4 Claims**



1. A fastener driving apparatus, comprising a housing and means for driving fasteners held in a fastener supply belt having a surface extending substantially in parallel to a longitudinal axis of said fasteners, said supply belt passing through said housing from a belt entry to a belt exit, means for cutting an empty belt portion near said belt exit, guide bushing means for mounting said belt cutting means near said belt exit for movement of said cutting means in a belt cutting operation, said housing comprising a belt guide channel between said belt entry and said belt exit, said guide bushing means for mounting said cutting means extending substantially perpendicularly to said belt guide channel for guiding said cutting means substantially perpendicularly to said supply belt surface, whereby said supply belt is cut in a direction substantially perpendicularly to said longitudinal fastener axis.

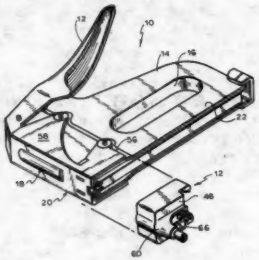
4,619,394
RIVETING ATTACHMENT FOR A STAPLE GUN

Barry Knispel, Hillsdale, and Rudolf Wingert, W. Milford, both of N.J., assignors to Arrow Fastener Company, Inc., Saddle Brook, N.J.

Filed Jul. 19, 1984, Ser. No. 632,628
Int. Cl.[4] B25B *31/00*; B25C *5/00*
U.S. Cl. 227—156 **16 Claims**

1. An attachment for connection to and use with a staple gun tacker having an outer housing including a working end and a staple driving blade mounted in said working end for recipro-

cating movement, said attachment being adapted for use in installing or setting a rivet of the type having a pin member mounted in a headed rivet shank having an expandable workpiece piercing free end, said attachment comprising a one piece attachment housing having a recess formed therein for receiving and being directly and removably mounted on said outer housing at said working end of said staple gun tacker and having a bore formed therein located to be in axial alignment with said staple driving blade when the attachment housing is mounted on said outer housing of the staple gun tacker, a hollow bushing mounted in said housing bore and having a flange formed thereon cooperating with a shoulder in said housing to limit outward movement of said bushing relative to the housing, a punch slidably mounted in said bushing for axial



movement therein, said punch having a free driving end and an opposed impact end located within said attachment housing; spring means for biasing said bushing away from said housing to cause the flange of the bushing to engage the shoulder of the housing and to retract into the housing against the bias of the spring means; said bushing and punch being positioned in said attachment housing such that the impact end of the punch in impacted by said driving blade of the staple gun tacker when the staple gun tacker is operated to apply a driving force thereto which drives the punch to engage the drive end of the punch with the pin member of the rivet to drive the pin member to expand the free end of the rivet; and means for preventing inadvertent removal of the punch from the attachment housing when the attachment is removed from the staple gun tacker.

4,619,395

LOW INERTIA MOVABLE WORKSTATION

Vincent G. Amorosi, Horsham; Gautam N. Shah, Warrington; Mark B. Soffa, Philadelphia; David A. Leonhardt, Norristown, and Gary L. Gillman, Warminister, all of Pa., assignors to Kulicke and Soffa Industries, Inc., Willow Grove, Pa.

Filed Oct. 4, 1985, Ser. No. 784,629

Int. Cl.[4] B23K *37/04*

U.S. Cl. 228—4.5 **19 Claims**

1. A low inertia movable workstation for a high speed automatic wire bonder, comprising:

a stationary base mounted on said wire bonder,

a vertical axis drive motor mounted on said stationary base,

a rotational axis drive motor mounted on said stationary base,

a vertical screw rotably mounted on said stationary base and coupled to said vertical axis drive motor,

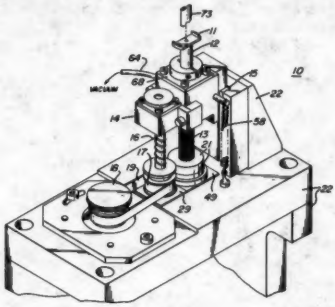
a vertically movable pedestal support frame coupled to said vertical screw and vertically movable by said screw,

a pedestal rotably mounted in said pedestal support frame and vertically movable therewith,

a workstation on said pedestal for supporting a semiconductor device opposite a bonding tool of an automatic wire bonder,

a vertically movable coupling fixed to said pedestal,

a vertically fixed complimentary coupling rotably mounted in said stationary base being rotably coupled to said vertically movable coupling and vertically fixed to said rotational axis drive motor, and



control means coupled to said vertical axis drive motor and said rotational axis drive motor for positioning said workstation and said semiconductor device in a predetermined vertical and rotational position.

4,619,396

COLD PRESSURE-WELDING APPARATUS

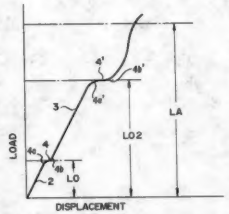
Toshio Yamamoto, Yokosuka, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 361,374, Mar. 24, 1982, abandoned. This application Sep. 17, 1984, Ser. No. 650,996

Claims priority, application Japan, Apr. 3, 1981, 56-49390

Int. Cl.[4] B23K *20/00*

U.S. Cl. 228—102 **2 Claims**



1. A method of adaptively controlled cold pressure welding, wherein a set of parts is pressure-welded at overlapping circular areas, said method comprising the steps of: detecting a load-displacement curve during the pressure-welding of the set of parts to be pressure welded, finding a second yield point by detecting a second inflection point in the load-displacement curve detected for said set of parts, determining an optimum pressure-welding load for said set of parts based on the load at the second yield point, and removing the pressure-welding load on the set of parts when the load reaches the optimum pressure-welding load.

4,619,397

METHOD OF AND APPARATUS FOR BONDING AN ELECTRICALLY CONDUCTIVE WIRE TO BONDING PADS

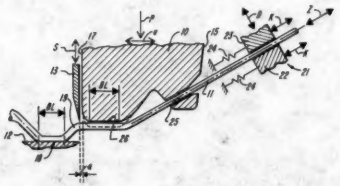
Peter Urban, Gärtnerstr. 44, Kolbermoor/BRD, Fed. Rep. of Germany

Filed Dec. 3, 1984, Ser. No. 677,189

Claims priority, application Fed. Rep. of Germany, Dec. 2, 1983, 3343738

Int. Cl.[4] B23K *20/10, 31/02*

U.S. Cl. 228—111 7 Claims



1. A method of bonding a thin, electrically conductive wire, especially an aluminium wire, to electrical bonding pads or areas of electric or electronic components, especially microchips or semiconductor components, in which the wire is briefly pressed against the bonding pad by means of an ultrasonically energized wedge and is subsequently severed at a slight spacing from the side of the wedge opposite the wire feeding side thereof by a cutting tool, such that the wire just severed by the cutting tool projects slightly beyond the side of the wedge opposite the wire feeding side, characterized in that after the severing operation and prior to another bonding operation the severed wire is retracted to such an extent that its free end is flush with the side of the wedge oppsoite to the wire feeding side thereof.

3. An apparatus for bonding a thin, electrically conductive wire, especially an aluminium wire, to electrical bonding pads or areas of electric or electronic components, especially microchips or semiconductor components, comprising an ultrasonically energized wedge for pressing the wire against the bonding pads and a cutting tool disposed on the side of the wedge opposite to the wire feeding side thereof and effective at a small spacing from said side for severing the wire after completion of a bonding operation, such that the wire just severed by the cutting tool projects slightly beyond the side of the wedge opposite the wire feeding side, characterized by means for moving the wire after the severing operation and prior to another bonding operation backwards at least to such an extent that the free wire end is flush with the side of the wedge opposite to the wire feeding side thereof.

4,619,398

CLOSER AND SEALER, EMPLOYING CHANNEL AND PARALLEL ALIGNING MEMBER, FOR GABLE-TOPPED FOOD CARTONS

Leon Laramie, P.O. Box 3493, Redwood City, Calif. 94064

Filed Sep. 30, 1985, Ser. No. 781,508

Int. Cl.[4] B65D *45/16*

U.S. Cl. 229—17 G 11 Claims

1. A closer and sealer for a gable-topped carton of the type having an elongated upper flap comprising a plurality of layers which can be squeezed flat to a predetermined dimension to hold said carton closed, said sealer comprising:

an elongated channel-shaped member, the width of the channel of said member having said predetermined dimension such that said channel can be fitted over said flap to hold the layers of said flap together tightly enough to seal said carton while still allowing said channel to be slided back and forth over said flap, said channel being long enough to cover at least half the length of said flap,

a lower arm portion extending parallel to said channel-shaped member, and

means for limiting travel of said channel-shaped member when it is slided onto said flap from one direction, said

means for limiting travel comprising a bight portion extending down from one end of said channel-shaped member and interconnecting said channel-shaped member with said lower arm portion.

4,619,399

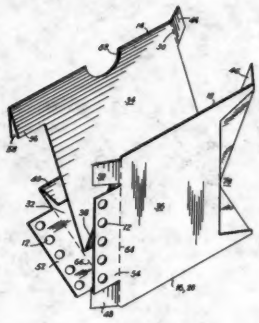
MULTI-POCKET ENVELOPE FOR FLOPPY DISCS

Szilvia Szmuk, 59 W. 82; J. Paul Kirouac, 200 W. 90 St., both of New York, N.Y. 10024, and Betsy Feist, 140 E. 81 St., New York, N.Y. 10028

Filed Aug. 10, 1984, Ser. No. 640,013

Int. Cl.[4] B65D *27/08*

U.S. Cl. 229—72 36 Claims



1. A multipocket envelope having a pocket for storing a substantially planar article, such as a floppy disk, and additional pockets for storing information pertaining to said planar article, said envelope being formed from a one piece elongate sheet having a pair of ends defining therebetween a long dimension of said sheet, said sheet defining four panels, an outer back panel at one end of said sheet, an inner back panel at the other end of said sheet, and outer and inner front panels therebetween, each of said four panels having two opposed sides and two opposed free ends, said free ends being substantially parallel to the long dimension of said sheet; said outer and inner back panels each having one free side coinciding with the ends of said sheet, one side of said outer and inner front panels being joined together along a first fold line substantially perpendicular to the long dimension of said sheet, the other side of said inner front panel being joined to said inner back panel along a second fold line perpendicular to said long dimension of said sheet, and the other side of said outer front panel being joined to said outer back panel along a third fold line perpendicular to said long dimension of said sheet, said panels being arranged in confronting parallel relation in said envelope for

defining a front pocket between said inner and outer front panels, a center pocket between said inner front panel and inner back panel, and a rear pocket between said inner and outer panels, and means for at least partially closing said pockets.

4,619,400

SELF CLEANING VARIABLE WIDTH ANNULAR SLIT ATOMIZER

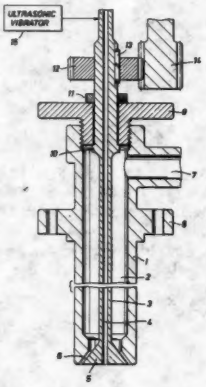
Maarten J. van der Burgt, The Hague, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Jun. 13, 1984, Ser. No. 620,309

Claims priority, application United Kingdom, Jun. 13, 1983, 8316051

Int. Cl.[4] B05B *3/02, 3/14*

U.S. Cl. 239—102.1 **8 Claims**



1. A self cleaning atomizer for liquids comprising:

a tubular body, said body having an open end and an inlet for supplying liquids under pressure to the interior of the body, said open end having a conical surface;

a valve stem extending through the tubular body, said valve stem being rotatably mounted coaxially within said tubular body;

a valve member having a conical shape, said valve member being secured to one end of said valve stem adjacent the open end of said tubular body and forming with the open end of the tubular body a substantially diverging annular slit nozzle of preselectable width;

means coupled to said valve stem to allow continuous rotation of the valve stem and valve member without changing a preselected width of the annular slit nozzle; and

means for vibrating the atomizer.

4,619,401

CONTROLLED DROPLET APPLICATOR

Dale G. Hardman, West Helena, Ark., assignor to Sprayrite Manufacturing Co., Inc., West Helena, Ark.

Filed Jan. 27, 1984, Ser. No. 574,603

Int. Cl.[4] B05B *3/10*; B64C *11/06*

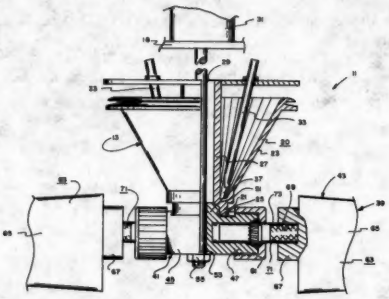
U.S. Cl. 239—214.17 **2 Claims**

1. Controlled droplet applicator means for applying fluid in droplet form to target vegetation, said applicator comprising:

(a) means for emitting fluid droplets against target vegetation;

(b) fan means for creating a high pressure air mass to stir the target vegetation as the fluid droplets are emitted against it without materially changing the size or density of the droplets, said fan means including a plurality of blade members; and

(c) adjustment means for allowing the pitch of said blade members to be varied and for controlling the amount of air movement to properly direct the air mass with the droplets therein to the target vegetation without further atomization of the droplets.



4,619,402

NOZZLE FOR SPRAYING AGRICULTURAL CHEMICALS

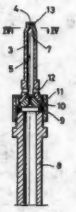
Kenzo Yamamoto, Wakayama, Japan, assignor to Yamaho Kogyo Co., Ltd., Wakayama, Japan

Filed Jun. 19, 1984, Ser. No. 622,266

Claims priority, application Japan, May 10, 1984, 59-68922[U]

Int. Cl.[4] B05B *7/04*

U.S. Cl. 239—428.5 **1 Claim**



1. A spray nozzle for spraying agricultural chemicals comprising:

a tubular body;

an orifice plate formed with an orifice and mounted on one end of the tubular body;

a tubular nozzle mounted on the orifice plate and formed with air holes of a given diameter each at a base portion thereof so as to allow outside air to communicate with all inner walls of the tubular nozzle; and

nut means, mounted on the tubular nozzle, for fastening the tubular nozzle, the orifice plate, and the tubular body together;

said tubular nozzle having at an outer tip thereof a hole in the shape of an ellipse with a major axis and a minor axis, said minor axis having a length greater than the given diameter of each of the air holes;

wherein the inner walls of the tubular nozzle along the minor axis of the ellipse-shaped hole are straight along the entire length of the tubular nozzle and only the inner walls of the tubular nozzle along the major axis of the ellipse-shaped hole are tapered at the outer tip of the tubular nozzle;

whereby the possibility of the hole in the shape of the ellipse at the outer tip being blocked by seeds sucked up through

the air holes is obviated, yet a sufficient initial velocity for the agricultural chemicals being sprayed through the hole is afforded.

4,619,403

SPRAY GUNS FOR SPRAYING LIQUIDS

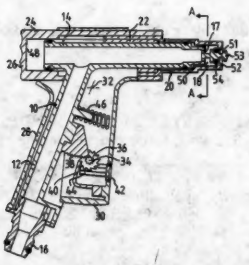
Dennis G. Goldney, and Bryn Evans, both of Aylesbury, England, assignors to Hozelock-ASL Limited, Aylesbury, England

Filed Dec. 21, 1984, Ser. No. 685,161

Claims priority, application United Kingdom, Feb. 8, 1984, 8403275

Int. Cl.[4] B05B *1/12*

U.S. Cl. 239—456 **9 Claims**



1. A pistol grip spray gun comprising:

(a) a handle,

(b) a barrel with an outlet nozzle for delivering a spray of liquid,

(c) an actuating member movable with respect to the handle in the manner of a trigger, the actuating member being movable from a closed position thereof, corresponding to a closed condition of the nozzle, along a path through a range of open positions with differing spray characteristics of the nozzle,

(d) retaining means for retaining the actuating member in a selected position in the range of open positions, the retaining means comprising a ratchet wheel and an arm which is normally urged into engagement with the wheel, the ratchet wheel being caused to rotate when the actuating member is moved relative to the handle, with the teeth of the ratchet wheel sliding over the ratchet arm when the actuating member is moved away from its closed position, and with the ratchet arm normally engaging the ratchet wheel to prevent return movement of the actuating member towards the closed position thereof, and

(e) release means comprising a manually operable release button on the actuating member normally out of operative engagement with the ratchet arm, movement of the release button in the direction of said path and relative to the actuating member causing movement of the ratchet arm out of engagement with the ratchet wheel, to free the latter, thus allowing the actuating member to return to or towards its closed position.

4,619,404

GAS DISTRIBUTION ARRANGEMENT FOR THE ADMISSION OF A PROCESSING GAS TO AN ATOMIZING CHAMBER

Henning Rasmussen, Hovedgaden, Regstrup, Denmark, assignor to APV Anhydro A/S, Soborg, Denmark

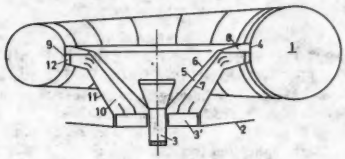
Filed Feb. 26, 1985, Ser. No. 705,548

Claims priority, application Denmark, Feb. 28, 1984, 1217/84

Int. Cl.[4] B01D *47/16*

U.S. Cl. 239—461 **3 Claims**

1. A gas distribution arrangement for the admission of a processing gas to an atomizing zone around an atomizing device coaxially arranged in an atomizing chamber, the processing gas being supplied to a helical inlet duct and admitted from an orificial slit in said helical duct, which is in rotational symmetry with the axis of the chamber, into a space between two coaxial guide walls around and above the atomizing device, said orificial slit being provided with guide vanes to impart to the flow of processing gas a change of direction from a substantially exclusively tangential flow in the helical duct to



a predominantly radial flow into the space between the coaxial guide walls, wherein each guide vane is a spatial body with differently extending, continuously curved, vertical limitation surfaces, which between adjacent guide vanes delimit ducts whose sectional area as measured transversely of the flow direction of the processing gas through the individual duct is substantially the same size over the extent of the duct.

4,619,405

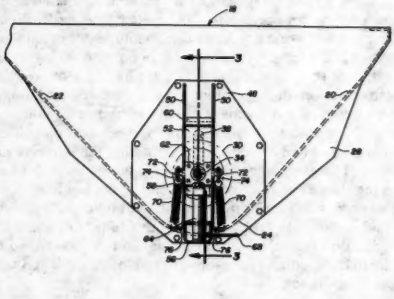
AUGER HOLD DOWN MECHANISM FOR MANURE SPREADERS

Gilbert W. Linde, Oxford, Pa., assignor to New Holland Inc., New Holland, Pa.

Filed Jul. 11, 1984, Ser. No. 629,919

Int. Cl.[4] A01C *19/00*

U.S. Cl. 239—675 **4 Claims**



1. A manure spreader comprising:

a tank for containing manure, said tank having a pair of sidewalls, a bottom wall and a pair of endwalls;

an auger extending between said pair of endwalls and having its ends rotatably mounted adjacent said pair of endwalls, said auger having stub shafts at its ends extending through and slidably disposed in slots formed in said pair of endwalls, said stub shafts being rotatably mounted in blocks which are slidably disposed between guide members attached to said endwalls, said auger having a normal position in said tank for moving manure toward an opening formed in one of said pair of sidewalls;

expeller means disposed adjacent said opening to discharge manure from said tank;

hydraulic cylinders mounted on said tank adjacent the ends of said auger for moving said auger from said normal position upwardly in said tank away from said bottom wall thereof, said auger also being movable from said

normal position upwardly in said tank independently of said hydraulic cylinders; and

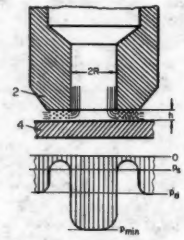
springs connected to said blocks adjacent the ends of said auger for urging said auger downwardly in said tank toward said bottom wall thereof, said springs returning said auger to said normal position after said auger has been moved upwardly by said hydraulic cylinders and after said auger has been moved upwardly independently of said hydraulic cylinders.

4,619,406

HYDRAULIC SYSTEM AND METHOD OF IMPROVING THE WORKING PROPERTIES THEREOF

Semyon I. Fishgal, Winnipeg, Canada, assignor to Can-Am Engineering Corporation, Cedar Falls, Iowa

Continuation of Ser. No. 753,419, Dec. 22, 1976, abandoned.
This application Oct. 23, 1978, Ser. No. 953,705
The portion of the term of this patent subsequent to Aug. 18, 1998, has been disclaimed.
Int. Cl.[4] B02C *19/06*; B01J *13/00*
U.S. Cl. 241—5 **12 Claims**



1. A method of improving the working properties of a closed circulating hydraulic system in which solid contaminants are produced through operation of the system, the method including the steps of breaking down the contaminants of said liquid by means of cavitation erosion to a size not interfering with the operation of the hydraulic unit, and retaining the broken down contaminants in the operating system and recirculating the borken down contaminants through the hydraulic units.

7. A hydraulic system including a hydraulic unit, lines, a working liquid and a means for maintaining the working properties of the latter, wherein said means constitute a device for breaking down the solid contaminants of the liquid into particles of a size not interfering with the hydraulic unit and retaining said particles in said working liquid and recirculating said particles through said hydraulic unit, said device including a nozzle to form a high-speed jet with a velocity sufficiently high to cause cavitation.

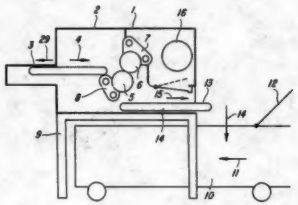
4,619,407

SHREDDING MACHINE AND METHOD OF OPERATION

Albert Goldhammer, Überlingen, Fed. Rep. of Germany, assignor to Firma Feinwerktechnik Schleicher & Co., Markdoff, Fed. Rep. of Germany

Continuation of Ser. No. 362,468, Mar. 26, 1982, abandoned.
This application Dec. 19, 1984, Ser. No. 683,588
Claims priority, application Fed. Rep. of Germany, Mar. 31, 1981, 3112913
Int. Cl.[4] B02C *18/40*
U.S. Cl. 241—30 **7 Claims**

1. Operation method for running a shredding machine of high throughput for comminution of multilayer papers, data carriers or the like with at least one drive motor (16) and a stator winding (17), which operates via at least one drive train on the cutter blocks (5,6) of the shredding machine and which upon overloading of the shredding machine can be automatically switched over to reverse operation, characterized in that upon overloading of the shredding machine initially a second



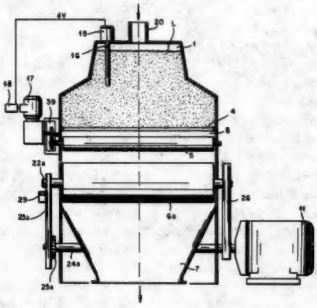
stator winding (18) is connected in parallel to the one stator winding (17).

4,619,408

CONTROL SYSTEM FOR GRINDING MILL

Guido Sangati, Padua, Italy, assignor to Sangati S.p.A., Padua, Italy

Filed Feb. 27, 1984, Ser. No. 583,931
Claims priority, application Italy, Feb. 25, 1983, 19774 A/83
Int. Cl.[4] B02C *25/00*
U.S. Cl. 241—34 **1 Claim**



1. In a grinding mill for converting farinaceous seeds into flour, including a metal hopper having an inlet at an upper end for receiving seeds to be ground, a pair of counterrotating cylinders for comminuting said seeds, and a transport roller disposed at an outlet of said hopper for extracting the seeds therefrom and delivering same to said cylinders, the combination therewith of:

a variable-speed drive motor coupled with said transport roller;

a continuous-output capacitive sensor having a cylindrical head mounted on said upper end and a uniform-diameter cylindrical rod depending from said head adjacent said inlet but in all around spacing from walls of said hopper and extending into seeds in said hopper for continuously determining the seed level therein and producing an analog signal representing said seed level;

means for grounding said hopper;

analog circuit means connected between said sensor and ground for controlling said motor to vary the speed of said transport roller continuously in a manner generally proportional to said seed level in response to said signal; and

a distributing roller interposed between said transport roller and said cylinders and coupled with said transport roller for rotating therewith at substantially the same peripheral speed, said cylinders being provided with a servomechanism controlled by said detector means for separating said

cylinders from each other upon said seed level dropping below a predetermined threshold.

4,619,409

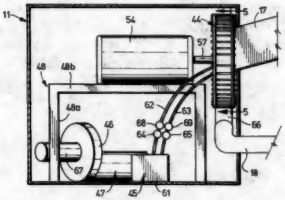
HOSPITAL WASTE DISPOSAL SYSTEM

Allan C. Harper; Joseph H. Wilson, both of Indianapolis; Randall G. McKee, Yorktown, and David N. Lasiter, Indianapolis, all of Ind., assignors to Medical Safetec, Inc., Indianapolis, Ind.

Filed Oct. 9, 1984, Ser. No. 658,701

Int. Cl.[4] B02C *9/04, 19/12*

U.S. Cl. 241—38 **22 Claims**



1. Apparatus for disposing of contaminated waste, comprising:

a generally sealed cabinet;

feeding means for feeding contaminated waste into said cabinet, said feeding means including first conveyor means capable of receiving a plurality of contaminated articles, and second conveyor means for automatically transferring said contaminated articles into said cabinet one at a time;

disintegrator means in said cabinet for disintegrating said waste articles fed into said cabinet, said disintegrator means comprising a pair of counter-rotating hammermill means;

decontaminating means including a decontaminating fluid in said cabinet for decontaminating said waste articles fed into said cabinet;

separator means for separating disintegrated and decontaminated waste articles from said decontaminating fluid; and

a normally closed door blocking access into said cabinet from said feeding means, and wherein said second conveyor means includes means for opening said door when a contaminated article is to be transferred into said cabinet.

4,619,410

FIELD CHOPPER

Xaver Lenzer, Kötz; Eberhard Wistuba, Rettenbach, and Hermann Mödinger, Kissendorf, all of Fed. Rep. of Germany, assignors to Karl Mengele & Söhne GmbH & Co. KG., Günzburg, Fed. Rep. of Germany

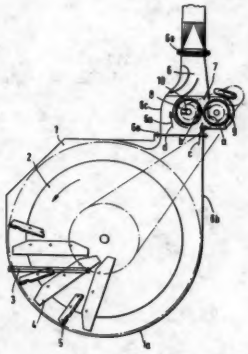
Filed Apr. 26, 1985, Ser. No. 727,586

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1984, 3415508

Int. Cl.[4] B02C *18/22*

U.S. Cl. 241—55 **6 Claims**

1. Field chopper comprising a comminution apparatus including a disc wheel chopper rotatable about an axis, and means for crushing the material chopped by the disc wheel chopper whereby the crushing means is located downstream of the chopped material flow through the disc wheel chopper, wherein the improvement comprises a housing, said disc wheel chopper located within said housing and including a disc wheel rotatably mounted in said housing about the axis of said chopper, said chopper axis being arranged horizontally, said housing having a circumferential wall extending around the horizontal axis of said chopper and defining a surface within said housing radially remote from and encircling the axis of said chopper, means on said disc wheel for carrying material chopped by said disc wheel chopper along the inside surface of said circumferential wall and moving the chopped material in a circumferentially extending flow direction, an elongated discharge tube extending upwardly and outwardly from the circumferential wall of said housing and having an entrance at the circumferential wall of said housing for receiving material thrown outwardly by the rotational action of said disc wheel chopper and said means thereon for carrying material, said discharge tube having a flow direction therethrough extending upwardly and outwardly from said housing and forming a first section having a cross-section transversely of the flow direction and extending outwardly from the circumferential wall of said housing with said first section having a first wall and an opposite second wall spaced from said first wall and extending outwardly in the flow direction of said discharge tube from the circumferential wall of said housing, the cross-section of said first section having a first part and a second part each extending in the flow direction of said discharge tube with the first



part extending from said first wall toward said second wall and said second part extending from said second wall to said first part intermediate the first and second walls, said second wall being located downstream from said first wall in the rotational direction of said disc wheel chopper, said crushing means located within said first part of the first section of said discharge tube outwardly from the circumferential wall of said housing for receiving a heavier component of the chopped material thrown outwardly by said disc wheel chopper through the entrance into said discharge tube, said second part of said first section of said discharge tube forming a duct for receiving a lighter component of the chopped material and an air flow generated by said carrying means on said disc wheel chopper with said duct formed by said second part having a decreasing flow cross-sectional area in the direction outwardly from said housing for accelerating the air flow therethrough around said crushing means, and said discharge tube having a second section extending outwardly in the flow direction therethrough from said first section.

4,619,411

RECOVERY APPARATUS

Derek S. Izzard, 12 Potton Road, Gamlingay, Cambridgeshire, England

Filed Jul. 6, 1984, Ser. No. 628,263

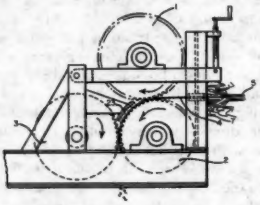
Claims priority, application United Kingdom, Jul. 12, 1983, 8318848; Nov. 2, 1983, 8329281

Int. Cl.[4] B02C *19/12*

U.S. Cl. 241—101.4 **5 Claims**

1. Apparatus for fragmenting high tensile steel cores of electrical cables, the apparatus comprising first and second sets of meshing gears supported on respective axles, a framework supporting the axles of said first and second sets of gears and having means for setting the first set of gears to clamp the core,

at least one of said first set of gears having driving means for rotating the first set of gears to progressively deform the core and convey the deformations into register with the second set



of gears and at least one of the second set of gears having driving means for rotating the second set of meshing gears to stretch and fracture the core.

4,619,412

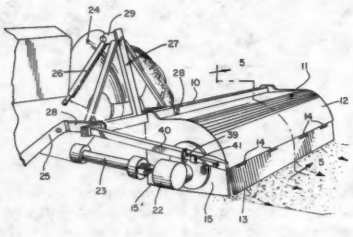
POULTRY LITTER DISINTEGRATING MACHINE

Jack Willingham, Rte. 7-Box 218, Mt. Pleasant, Tex. 75455

Filed Aug. 19, 1985, Ser. No. 766,970

Int. Cl.[4] B02C *21/02*

U.S. Cl. 241—101.7 **8 Claims**



1. A poultry litter disintegrating machine comprising a housing which is substantially open at its forward side and bottom and being provided with end walls and at least a partly curved top wall, a rigid hitch structure on the housing adjacent to its forward side and extending above the top of the housing and being adapted for coupling with a tractor three point hitch, a transverse horizontal axis flail rotor within and journaled on the housing and extending between the housing end walls and carrying a multiplicity of pivoted flail hammers having litter chopping heads along its length, power drive means for the flail rotor including a drive component on one end wall of the housing, runners on the end walls of the housing adapted to engage a poultry house floor during movement of the machine therealong, and a fixed somewhat inclined litter layer pre-cutting blade on the housing near its bottom and forward side and immediately above said runners and near the bottom of said flail rotor.

4,619,413

FORAGE OR PICKING HARVESTER

Eberhard Wistuba, Rettenbach, Fed. Rep. of Germany, assignor to Karl Mengele & Söhne GmbH & Co., Günzburg, Fed. Rep. of Germany

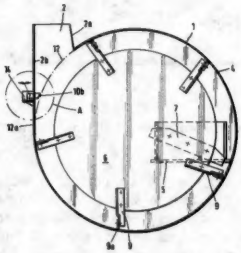
Filed Nov. 22, 1983, Ser. No. 554,258

Claims priority, application Fed. Rep. of Germany, Nov. 22, 1982, 3243077

Int. Cl.[4] B02C *18/18*

U.S. Cl. 241—222 **8 Claims**

1. Forage or picking harvester, such as a flywheel cutter, for the rough grinding of grain, comprising a housing having an inlet and an outlet spaced on said housing from said inlet, a cutting blade wheel located within said housing and rotating about a horizontal axis extending through said housing, wherein the improvement comprises that said housing has a cylindrically shaped wall extending around the axis of said cutting blade wheel and defining the circumferential periphery of said housing, said outlet comprises a discharge duct projecting upwardly and outwardly from said cylindrically shaped wall with the opening into said discharge duct located through said cylindrically shaped wall, a plurality of blades mounted in angularly spaced relation on said cutting blade wheel and extending generally radially of the axis thereof with the radially outer ends of said blades being continuous in the direction of the axis of said cutting blade wheel for the full width of each blade and moving along a circle located at the inner surface of said cylindrically shaped wall so that the radially outer ends move upwardly past the opening into said discharge duct, said discharge duct having a first wall extending upwardly and outwardly from the circumferential periphery of said housing



and with the surface of said first wall facing into said discharge duct facing toward the circumferential periphery of said housing, at least one comb-like arrangement of laterally spaced bearing arms mounted in said first wall of said discharge duct with said beating arms extending from said first wall to approximately the circle along which the radially outer ends of said blades move and spaced closely outwardly from the circle so that grain carried by the radially outer ends of said blades is directed into said discharge duct against said beating arms, said beating arms having upwardly extending flat side surfaces extending generally parallel to one another and to the flow through said discharge duct, slots extending in the direction of said discharge duct conveying flow of said housing are located in said first wall, and said beating arms extend through said slots from the exterior of said discharge duct into said discharge duct and the length of said beating arms being adjustably positionable within said discharge duct, and means located on the exterior of said discharge duct for securing said beating arms in position.

4,619,414

MULTI-DISK REFINER

Edward C. Kirchner, Pittsfield, and Ronald J. DeFoe, Becket, both of Mass., assignors to Beloit Corporation, Beloit, Wis.

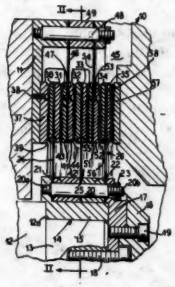
Filed Jan. 31, 1985, Ser. No. 697,049

Int. Cl.[4] B02C *7/14*

U.S. Cl. 241—261.3 **8 Claims**

1. In an apparatus for refining fibrous materials including a housing, an inlet into said housing for receiving fibrous materials to be treated, an outlet from said housing for discharging treated materials, a shaft rotatable in said housing, a first plurality of refiner disks spaced along said shaft for rotation therewith, an additional plurality of refiner disks interleaved with said first plurality of disks and providing with the rotating disks pairs of refiner disks which rotate relative to each other and provide a refining gap therebetween, the confronting faces of the disks presenting confronting ribs to the fibrous materials

passing through said refining gaps, and axially flexible annular membranes supporting both pluralities of disks in spaced relation, the improvement which comprises:



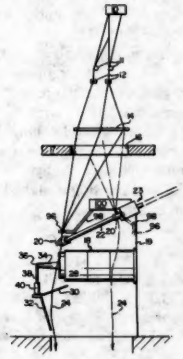
said refiner disks having undercut portions in the surfaces in which said flexible annular membranes are drivingly connected to permit bowing of said membranes within said undercut portions and thereby increase the axial flexibility of said membranes.

4,619,415

STRAND WINDING APPARATUS

Leslie J. Harris, Waterloo, Canada, assignor to Fiberglas Canada Inc., Toronto, Canada

Filed Aug. 12, 1985, Ser. No. 764,607
Claims priority, application Canada, Mar. 29, 1985, 477945
Int. Cl.[4] B65H *54/02, 67/04*
U.S. Cl. 242—18 G **23 Claims**



1. Automatic strand winding apparatus for use in a strand winding machine having a rotatable winding collet and means for traversing a strand to and fro along said winding collet to form a package on said winding collet, said strand winding apparatus comprising:

a first strand engagement means adapted to be mounted on a free end of said winding collet for rotation therewith into engagement with said strand;

said first strand engagement means having means for catching said strand on rotation of said winding collet and thereby causing a first portion of said strand to become wound on said first strand engagement means;

second strand engagement means for frictional engagement with said strand; and

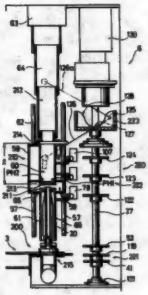
means for supporting said second strand engagement means in an operational position adjacent said first strand engagement means and in alignment with said winding collet to cause a second portion of said strand to wind around and in frictionally engaged contact with said second strand engagement means during the winding of said first portion of said strand on said first strand engagement means until breakage of said strand occurs in response to tension in said strand between said first and second strand engagement means.

4,619,416

YARN END FINDING APPARATUS

Isamu Matsui, Kyoto; Hiroshi Uchida, Ohmihachiman; Noboru Sekitani, Ohtsu, and Hirokazu Okumura, Kyoto, all of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 16, 1984, Ser. No. 631,304
Claims priority, application Japan, Jul. 19, 1983, 58-1315241
Int. Cl.[4] B65H *54/20, 65/00, 67/02*
U.S. Cl. 242—35.5 R **14 Claims**



1. A yarn end finding apparatus useable with a spinning bobbin which is located at a fixed position, the bobbin being of the type which comprises a take-up tube erected at one end thereof on a carrier and having yarn wound around the take-up tube, wherein the yarn windings nearest the other end of said tube form a top bunch, the apparatus comprising:

a member mounted for vertical movement along the axial direction of the take-up tube toward and away from the spinning bobbin, the vertically movable member having mounted thereon:

a releasing means for releasing the top bunch, containing the yarn end, from the spinning bobbin;

a suction means for sucking the yarn end thus released vertically away from the bobbin;

a clamping means, disposed above said releasing means, for clamping the yarn which is sucked away from the bobbin;

a cutting means, above said clamping means, for cutting the yarn, which is sucked away from the spinning bobbin, at a predetermined position; and

a suction pipe having a first opening located below the carrier at said fixed position for inserting the yarn end thus cut into the take-up tube of the spinning bobbin.

4,619,417
ACCELERATION SENSOR

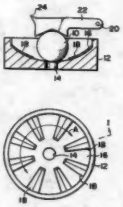
Fuminori Teraoka; Takeo Matsui, and Shinji Mori, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho, Aichi, Japan

Filed Mar. 20, 1984, Ser. No. 591,510

Claims priority, application Japan, Mar. 22, 1983, 58-040891[U]

Int. Cl.[4] B60R *22/40*

U.S. Cl. 242—107.4 A **7 Claims**



6. An acceleration sensor adapted for use in a seatbelt system for protecting an occupant in a vehicle, comprising:

(a) a rolling body which moves when an acceleration acts thereupon;

(b) a receptacle member for supporting the rolling body thereon, the receptacle member being formed with a slope which rises from a bottom center portion which defines a stop position for the rolling body, and which ends at a top periphery of the receptacle member, said slope having a plurality of ribs for preventing the rolling body from rolling around its stop position in response to vibration, wherein none of said ribs come into contact with said rolling body when said body is at its stop position so that said body is equally free to roll out of its stop position in any radial direction in response to an acceleration indicative of an emergency vehicular situation, and

(c) an actuator disposed on the rolling body, one end portion thereof being pivotally mounted through a support means, and a portion of the actuator having a conical recess for contacting the rolling body and being pivotally movable upwardly when said rolling body rolls up said slope a certain radial distance.

4,619,418
SELF-LOCKING BELT REEL-IN MECHANISM FOR SAFETY BELTS

Klaus Butenop, Herzhorn, Fed. Rep. of Germany, assignor to Autoflug GmbH, Rellingen, Fed. Rep. of Germany

Filed Mar. 26, 1985, Ser. No. 716,035

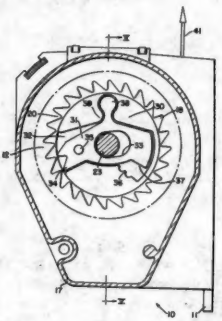
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1984, 3411067

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 A **11 Claims**

1. A self-locking belt reel-in mechanism for safety belts; said mechanism has a housing, and a belt reeling-in shaft having a full circular-shaped solid cross section which is mounted therein in such a way that it cannot be displaced axially, but can be displaced radially after arresting engagement and under the effect of locking forces without any synthetic material thrust-collar bearing aid; the ends of said belt reeling-in shaft extend through respective openings of said housing, and are each provided, in the plane of its opening, with an arrangement which provides for the arresting of said belt reeling-in shaft; one of these arresting arrangements engages a fixed internal toothing of one of said openings of said housing when locking forces occur which do not exceed a predetermined value, and when locking forces occur which exceed the last-mentioned locking forces, both of said arresting arrangements engage a respective fixed internal toothing of their opening of said housing, so that arresting, and hence locking, of said belt reeling-in shaft results either at one end or at both ends of the latter; the improvement therewith wherein:

to form a first one of said arresting arrangements, one of said ends of said belt reeling-in shaft is provided with a hub effective in the full circular-shaped solid cross section including therewith a recessed portion in which is disposed a locking member; the depth of said recessed portion is such that said locking member is flush relative to the plane of the associated opening of said housing; said locking member is pivotably mounted in said recessed portion, eccentrically relative to said belt reeling-in shaft, and is provided with tooth-like latching projections to effect said engagement with said internal toothing of the assoicated opening of said housing; and



to form the other of said arresting arrangements, the associated end of said belt reeling-in shaft is provided with a peripheral toothing, which is flush with the plane of the associated opening of said housing, to effect said engagement with said internal toothing of said associated opening of said housing; that end of said belt reeling-in shaft associated with said first arresting arrangement being provided with an annular peripheral surface located in the projection of said recessed portion; with the exception of an interruption which allows said latching projections of said locking member to pass through, said peripheral surface forming said hub which is centrally disposed in that associated opening of said housing designed for engaging said first arresting arrangement.

4,619,419
APPARATUS FOR THE AUTOMATIC ROLLING UP OF A VEHICLE SAFETY BELT

Karl H. Essler, Tornesch, Fed. Rep. of Germany, assignor to Autoliv GmbH, Elmshorn, Fed. Rep. of Germany

Filed Feb. 21, 1985, Ser. No. 703,739

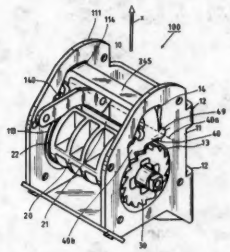
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1984, 8405545[U]

Int. Cl.[4] B60R *22/38, 22/40*

U.S. Cl. 242—107.4 A **3 Claims**

1. Apparatus for the automatic rolling up of a vehicle safety belt, comprising a casing in the form of a U-shaped frame with said frame comprising a pair of spaced side plates interconnected by a web, said side plates each having an inside surface and an outside surface, each said side plate having a first opening extending therethrough, a belt shaft extending between and rotatably mounted about an axis extending through said first openings, at least one ratchet wheel secured to said belt shaft at one end thereof and said ratchet wheel being located between the planes formed by the inside and outside surfaces of one of said side plates, a locking pawl pivotally mounted in a second opening in said side plate containing said opening in which said ratchet wheel is located, said second opening being contiguous

to and being open to said first opening containing said ratchet wheel, said ratchet wheel having teeth spaced circumferentially thereon, said locking pawl having a first end and a second end with the first end having a pivot axis disposed parallel to the axis of said belt shaft, wherein the improvement comprises that said second opening has a circular recess in the boundary surface thereof adjacent said first opening, said locking pawl has a bearing counterpart at the first end thereof pivotally mounted in said circular recess so that said pawl is pivotally displaceable as said bearing counterpart pivots in said circular recess about the pivot axis of said locking pawl between a first position with said locking pawl in meshed engagement with said teeth on said ratchet wheel and a second position with said locking pawl spaced out of engagement with said teeth on said ratchet wheel, said locking pawl comprises an angularly shaped plate member having a first leg of said plate member extending in the first end-second end direction of said locking pawl and a second leg extending transversely of said first leg, said first leg and second leg forming a junction facing away



from said ratchet wheel, a bearing recess formed in said pawl at the junction, an actuating pin located in said recess for displacing said pawl between the first and second positions, said first leg at the second end of said locking pawl having a plurality of engagement teeth for engagement with said teeth on said ratchet wheel in the first position of said locking pawl, the end of said leg located at the second end of said locking pawl has a rectilinear surface extending transversely of the first end-second end direction of said locking pawl and extending from said engagement teeth at the second end of said lockiing pawl, said rectilinear surface forming a flux force transfer surface arranged to contact and be supported by a mating surface forming a boundary surface of said second opening adjacent to said first opening when said locking pawl is in the first position, said flux force transfer surface being displaced into contact with said mating surface when tensile force acts on the safety belt whereby said actuation pin acts on said locking pawl for displacing said locking pawl into the first position whereby the forces are absorbed by said casing and the pivot bearing for said pawl is free of the forces.

4,619,420

TAPE CASSETTE

Klaus Schoettle, Heidelberg, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

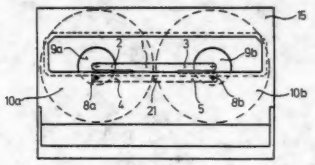
Filed Jun. 13, 1985, Ser. No. 744,202

Claims priority, application Fed. Rep. of Germany, Jun. 15, 1984, 8418179[U]

Int. Cl.[4] G03B *1/04*; G11B *15/32, 23/04*

U.S. Cl. 242—198 **9 Claims**

1. A tape cassette comprising a housing having a housing part, at least one flanged tape reel and a pressure spring having at least one fastening arm fastening the pressure spring to the said housing part and at least one pressure spring arm for exerting a spring force on the tape reel(s) in the direction of a defined operating position, said at least one tape reel having a depression in the flange facing the said housing part and an end region of the at least one fastening arm possessing fastening means for fastening the pressure spring to the said housing part



in an area facing the depression provided in the at least one tape reel.

4,619,421

SENSOR ARRANGEMENT IN A SEARCH HEAD

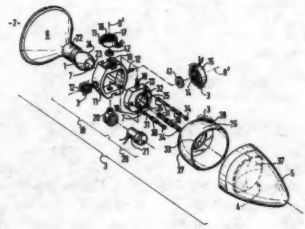
Gunther Trummer, Baiersdorf, Fed. Rep. of Germany, assignor to Diehl GmbH & Co., Nuremberg, Fed. Rep. of Germany

Filed Nov. 7, 1984, Ser. No. 669,105

Claims priority, application Fed. Rep. of Germany, Nov. 26, 1983, 3342958

Int. Cl.[4] F41G *7/26*

U.S. Cl. 244—3.16 **10 Claims**



1. In a sensor arrangement within a search head, including a two-axis cardan frame system on said search head for effecting the movements of a sensor relative to the search head; the improvement comprising said sensor being axially offset ahead of said cardan frame system; paired spherical surface members supporting said frame system and sensor, said spherical surface members being extended through by a spine passageway; and a parallelogram linkage interconnecting said sensor and said cardan frame system.

4,619,422

BALLOON CARRIAGE

John R. Petrehn, 11876 W. 91st St., Overland Park, Kans. 66214

Filed Jan. 6, 1984, Ser. No. 568,825

Int. Cl.[4] B64B *1/40*

U.S. Cl. 244—127 **2 Claims**

1. A gondola arrangement for a hot air balloon comprising:

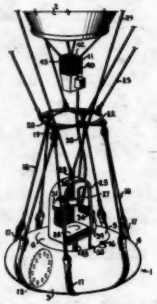
(a) a rigid toroidal carriage formed of windings of synthetic fibrous material coated with resin and having external and internal walls forming an enclosure; said enclosure providing a central opening and said walls defining an internal and integral reservoir for storage of fuel for said balloon;

(b) a floor extending across said central openings for supporting a crew;

(c) carriage support lines extending from said carriage to said balloon and routed through a circular girdle with a jettison cable whereby severing part of said jettison cable provides for jettisoning of said carriage; and

(d) a crew module connected to said balloon by module support lines separate from said jettison cable and said

carriage support lines and positioned between said balloon and said carriage;



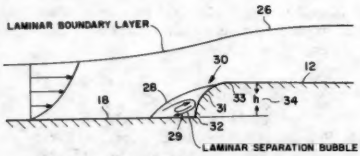
(e) said crew module having a reserve fuel supply and a burner for providing heated air for said balloon for emergency use upon jettisoning said carriage.

4,619,423

GEOMETRIES FOR ROUGHNESS SHAPES IN LAMINAR FLOW

Bruce J. Holmes; Glenn L. Martin, both of Newport News; Christopher S. Domack, Hampton; Clifford J. Obara, Poquoson, all of Va., and Ahmed A. Hassan, Tempe, Ariz., assignors to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Nov. 10, 1983, Ser. No. 550,681
Int. Cl.[4] B64C *21/10*
U.S. Cl. 244—130 **22 Claims**



22. The method of obtaining natural laminar flow over an airfoil comprising the steps of:

smoothing the upper and lower skin structure of an airfoil sufficient to allow laminar flow;

placing a smooth leading edge structure adjacent said skin structures;

joining said leading edge structure to said skin structure;

providing a forward facing step joint rising above the leading edge structure and located before the skin structure; and

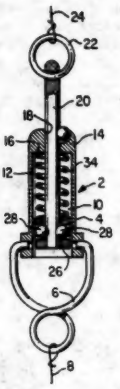
shaping the step joint between the leading edge structure and skin structure to cause laminar separation before and reattachment after a laminar separation bubble formed thereat which allows extended natural laminar flow after the step joint location.

4,619,424

TENSION LINK FOR PARACHUTE/PAYLOAD SEPARATION

Philip A. Twardawa, Shannon, and Michel C. St-Onge, Neufchatel, both of Canada, assignors to Her Majesty the Queen in right of Canada, Canada

Filed Jan. 4, 1985, Ser. No. 688,897
Claims priority, application Canada, Feb. 15, 1984, 447502
Int. Cl.[4] B64D *17/38*
U.S. Cl. 244—151 B **15 Claims**



1. A mechanical device to link a payload and a parachute together prior to and during the parachute dropping of the payload, and to effect automatic separation of the payload from the parachute after the payload and the parachute have landed, the device comprising:

(a) a housing to which either the parachute or payload is to be secured;

(b) an elongated shaft movable within the housing in the direction of the longitudinal axis of the shaft, one end of the shaft extending from the housing to which end the other of the parachute or payload is to be secured, the shaft being movable with respect to the housing between an armed position in one direction and an uncoupling position in the other;

(c) retainer means releasably secured to the other end of the shaft so that movement of the retainer means and shaft is physically constrained by the housing from going beyond the armed position in said one direction;

(d) first biasing means to apply an uncoupling force against the housing and the retainer means to urge the shaft and retainer means towards the uncoupling position, the uncoupling force being less than the force which would normally exist urging the shaft towards the armed position during the parachute dropping of the payload;

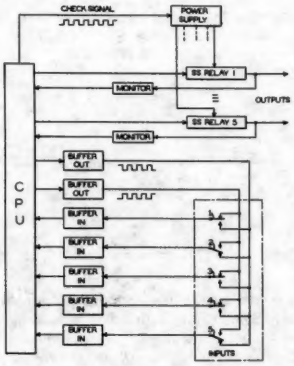
(e) first locking means directly engaged with the shaft and the housing and releasably securing the shaft to the housing, in a fixed, intermediate, unarmed position, the first locking means adapated to be released in response to the application of an unlocking force of predetermined magnitude to the shaft in said one direction, the magnitude of the unlocking force being greater than the uncoupling force of the first biasing means in the other; and

(f) second locking means associated with the shaft and retainer means and securing the retainer means to the shaft when the shaft is in unarmed position and armed position but releasing the retainer means from the shaft when the shaft is in uncoupling position, the retainer means when thus released freeing the shaft to be extracted from the housing, thereby resulting in separation of the payload from the parachute.

4,619,425
PULSE CODE SYSTEM FOR RAILROAD TRACK CIRCUITS

Harry C. Nagel, Murrysville, Pa., assignor to American Standard Inc., New York, N.Y.

Filed Jul. 17, 1981, Ser. No. 284,150
Int. Cl.[4] B61L 21/00
U.S. Cl. 246—34 R 14 Claims



1. A pulse code system for transmitting in each direction through the rails of a section of railroad track data representing wayside conditions and controls associated with that section, comprising,

(a) transmitter/receiver means coupled to the rails at each end of said section for transmitting and receiving through said rails an alternating current code having selected pulse characteristics,

(b) a data processor means coupled to each transmitter/-receiver means for selecting, in accordance with applied input data, the pulse characteristics of each code transmitted through the rails to the receiver at the other end of said section and for decoding the data carried by the code pulses received through the rails from the transmitter at said other end,

(c) an input network coupled to each processor means for supplying wayside input data for transmission to said other end,

(d) an output means coupled to each data processor means for outputting the data decoded from received code pulses,

(e) a power supply means coupled to each output means for providing operating energy,

(f) a first monitor network controlled by each data processor means and coupled for dynamically checking the operation of the associated output means and responsive for supplying monitor signals to said processor means when correct operation of the associated output means and said first monitor network is detected,

(g) a second monitor network jointly controlled by each data processor means and associated input network and coupled for checking the integrity of the associated input network and completeness of the input data supplied,

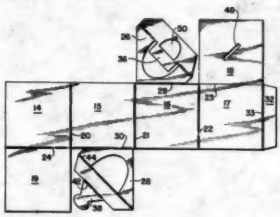
(h) each data processor means responsive to monitor signals from the associated first monitor network and to the integrity check of the associated second monitor network for generating a check signal, and

(i) each power supply means coupled to the associated processor means for receiving said check signal and enabled for providing operating energy to the associated output means only when said check signal is present.

4,619,426
SELF-ERECTING HOLLOW STRUCTURE

Fred Drueck, Jr., 4941 W. Henderson St., Chicago, Ill. 60641

Filed May 22, 1985, Ser. No. 736,854
Int. Cl.[4] B65D 5/08, 5/36, 5/52
U.S. Cl. 248—174 7 Claims



1. A collapsible, self-erecting closed hollow structure which is formed from an integral blank of paperboard which is cut and scored to form a plurality of side and end walls which when erected form said closed hollow structure, each of said plurality of side and end walls being hingedly connected along one edge thereof with one at least one other wall;

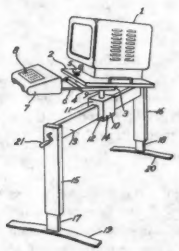
at least two flaps, each of which is hingedly connected along one edge thereof with at least one of said plurality of side walls, each of said flaps being cut and scored to form an attachment and further being folded and affixed to one of said plurality of end walls on the side thereof which is interior of the closed erected hollow structure, and

elastic means secured under tension to said attachments, said elastic means normally pulling said two end walls to which said flaps are hingedly connected toward one another and thereby erecting said closed hollow structure.

4,619,427
STAND FOR DATA DISPLAY TERMINALS

Friedhelm Leymann, Langenhagen, Fed. Rep. of Germany, assignor to Heinrich Oelschlager Metallwarenfabrik, Fed. Rep. of Germany

Filed Jun. 29, 1984, Ser. No. 626,049
Int. Cl.[4] F16M 11/04
U.S. Cl. 248—178 6 Claims



1. A stand for a display terminal comprising a plate supporting said terminal,

a carriage having an inverted U-shape with a lower end and supporting said plate,

a horizontally disposed rail, said carriage fitting over the top of the rail and being supported on and held against lateral tilting by the rail for horizontal movement on the rail and

a bearing plate secured to the lower end of said carriage, and bearing plate positioned against the underside of the rail to further prevent the carriage from tilting.

4,619,428

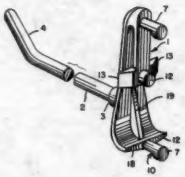
SUPPORT MEMBER FOR APERTURED SUPPORTING SURFACES

James R. Bailey, 4020 N. Pioneer, Chicago, Ill. 60634

Continuation of Ser. No. 516,637, Jul. 25, 1983, abandoned. This application Jan. 7, 1985, Ser. No. 689,146

Int. Cl.[4] B61L *5/00*

U.S. Cl. 248—221.2 **3 Claims**



1. For use with an apertured mounting board having an array of substantially identical small circular holes therein, each of the order of ¼–¾ inch in diameter, and arranged in substantially equally spaced rows and columns, and including at least three of such holes are vertically aligned, the combination of an improved self-locking support member adapted to be automatically, but releasibly, locked onto the mounting board off the front side thereof, said support member comprising,

an elongated unitary rigid body sized to span the three holes in the mounting board, and having opposed front and rear faces;

three spaced but aligned projections disposed rearwardly of and substantially normal to the rear face of the elongaged body, and adapted to be inserted axially into and through said board holes from the front side of the mounting board;

two of the projections being spaced apart a distance corresponding to the spacing between two of the board holes and being substantinally rigid relative to the elongated body and to each other;

tabs integrally formed on the two projections, spaced from the rear body face a distance corresponding approximately to the thickness of the mounting board;

said two tabs and two projections being sized, to be inserted axially into the board holes until the tabs clear the rear face of the mounting board, and then to be moved laterally to a set position, where the projections are against the board at the holes and the tabs overlap and engage the rear board face and preclude axial removal from the board holes;

an arm integral with the body near one of the two projections and cantilevered therefrom toward the other of the two projections and being elongated substantially in line with the rear body face, and the third of the three projections being formed integrally of and rigidly on the arm at the free end thereof,

said arm

being substantially rigid against movement in the direction along the rear body face between the two projections,

having limited flexibility to allow limited movement in the direction transverse to the rear body face,

being operable to hold the third projection aligned over the third of the board holes, when the two projections are in their respective two board holes and in the set position, and

having its natural unflexed position such that when such third projection is aligned with the third board hole, it would urge the third projection into the third board hole;

the third projection having a circular cross section, and also being sized to just fit into its board hole, and

being operable thereby to retain the two tabs and projections in the set position relative to their respective two board holes, so as to lock the support member as mounted relative to the mounting board; and

means projecting forwardly of the front face of the rigid body adapted to support objects thereon relative to the mounting board.

4,619,429

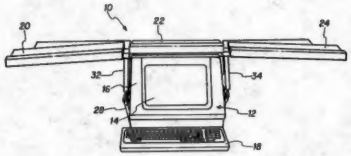
COPY HOLDER FOR DATA PROCESSING WORK STATION

Louis S. Mazza, 5737 Drexel Dr., Garland, Tex. 75043

Filed Oct. 5, 1984, Ser. No. 657,983

Int. Cl.[4] A47B *97/04*

U.S. Cl. 248—447.2 **12 Claims**



1. Copy holder apparatus for supporting printed sheet material for use in combination with a data processing work station of the type having a data display screen mounted in a cabinet, the copy holder apparatus comprising, in combination:

a harness assembly including a flexible tension member, a first hinge assembly, a second hinge assembly and a cross bar, the first and second hinge assemblies being linked together by the cross bar and by the flexible tension member thereby defining a harness assembly mountable onto a cabinet, wherein the first and second hinge assemblies are adapted for mounting onto opposite top corners of the cabinet, with the cross bar extending across the top of the cabinet, and the flexible tension member being adapted for lashing engagement around the cabinet bottom and tensioning the hinge assemblies into compressive engagement with the cabinet;

first and second wing panels mounted onto the cross bar;

holder means coupled to the harness assembly for displaying printed sheet material adjacent the data display screen, and,

said holder means including first and second correspondence boards movably coupled to the first and second wing panels, respectively.

4,619,430

PICTURE FRAME HANGER

James W. Hogg, Nashville, Tenn., assignor to Anchor Wire Corporation of Tennessee, Goodlettsville, Tenn.

Continuation-in-part of Ser. No. 393,550, May 30, 1982, Pat. No. 4,485,995, which is a continuation-in-part of Ser. No. 268,499, May 29, 1981, Pat. No. 4,422,608. This application Mar. 28, 1984, Ser. No. 594,395

Int. Cl.[4] A47G *1/16*

U.S. Cl. 248—467 **19 Claims**

12. A device for suspending picture frames having flexible, elongated hanging means comprising:

a backplate;

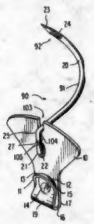
means for attaching said backplate to a wall having a thickness;

a lip having a convex surface facing said backplate securely fastened at a point of attachment to said backplate and extending upwardly and outwardly therefrom;

an arced groove having sidewalls for supporting a portion of the flexible, elongated hanging means, one of said sidewalls being said convex surface of said lip and the other of said side walls being said backplate; and

said arced groove adapted to receive the supported portion of the flexible, elongated hanging means whereby said

flexible, elongated hanging means is urged to slide inwardly and downwardly to a position in abutment with both said sidewalls whereby the distance between the load center of the supported portion of the flexible, elongated hanging means and the backplate is reduced so that the



outward component of force transmitted from the load of the picture frame through the supported portion of the flexible, elongated handing means, said lip, and said backplate to said means for attaching said backplate is minimized.

4,619,431

APPLIANCE FOR FIXING ELECTRONIC DISPLAY BOARD

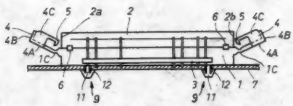
Kazuhiro Matsui, Toyoake, and Haruyuki Sugiura, Kariya, both of Japan, assignors to Kitagawa Industries Co., Ltd., Nagoya, Japan

Filed Dec. 6, 1984, Ser. No. 679,070

Claims priority, application Japan, Dec. 16, 1983, 58-194784[U]

Int. Cl.⁴ F16M *13/00*

U.S. Cl. 248—500 **7 Claims**



1. An appliance for fixing an electronic display board, comprising:

a flat elongated plate-like support body,

elastic retaining members connected to said support body by thin-walled connections adjacent to both longitudinal ends of said support body, said elastic retaining members being bendable through said thin-walled connections to a holding position such that an electronic display board on a surface of the fixing appliance body may be held thereon,

pawl retaining pieces adapted to engage pawls of the elastic retaining members when said elastic retaining members are bent to said holding position,

snaps projecting from another surface of the support body for fixing said appliance body to a substrate; and

a terminal holding frame on at least one longitudinally extending edge portion of said support body, the terminal holding frame having terminal guide holes therein.

4,619,432

DEVICE FOR RAPIDLY MOUNTING A BASE PLATE ON A CHASSIS

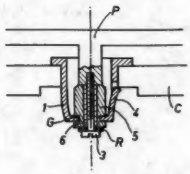
Michel P. Beugin, Flers, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 23, 1985, Ser. No. 737,015

Claims priority, application France, May 29, 1984, 84 08389

Int. Cl.⁴ F16F *15/08*

U.S. Cl. 248—635 **2 Claims**



1. A bracket for rapidly mounting a base plate on a chassis with an aperture comprised of

(a) a cup-shaped mounting element adapted to fit into said aperture, said mounting element having an outwardly extending lip at its upper end, a cylindrical surface and a bottom with an opening therein forming a bottom rim,

said mounting element having both an opening and at least one radially extending flexible arm formed in its cylindrical surface,

a gap in said bottom and in said cylindrical surface joining said opening in said cylindrical surface with said opening in said bottom,

(b) an elastic damping element having a slot in its outer surface, and having an elongated hollow tubular shape, part of said damping element being located within said mounting element,

said bottom rim being engaged in said slot of said damping element whereby said damping element is held in place by said mounting element; and

(c) a securing means passing through said opening in said bottom of the mounting element and through said damping element into said base plate for attaching said mounting element to said base plate whereby when properly so attached said mounting element is secured to said chassis through the pressure exerted thereon in opposite directions by said lip and said radially extending arm.

4,619,433

APPARATUS FOR ERECTING ARCUATE WALLS OF CONCRETE OR THE LIKE

Josef Maier, Schwimmbadstrasse 3, D-7611 Steinach, Fed. Rep. of Germany

Filed Sep. 11, 1984, Ser. No. 649,473

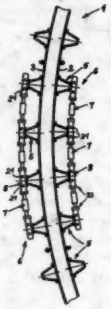
Claims priority, application Fed. Rep. of Germany, Sep. 17, 1983, 3333619; European Pat. Off., Apr. 19, 1984, 84104458.9

Int. Cl.⁴ B28B *7/04, 7/30*

U.S. Cl. 249—18 **9 Claims**

1. Apparatus for forming an arcuate wall of concrete or the like, comprising a plurality of spaced apart elongated supports; a flexible sheathing having spaced apart portions secured to and turnable with said supports about axes extending longitudinally of said supports, said sheathing having a first side facing said supports and a second side facing away from said supports; and means for turning said supports, including a composite girder comprising neighboring connectors turnable with said supports, variable-length links disposed between neighboring connectors, fastener means for articulately connecting said links to the respective connectors so as to allow for changes in the angular positions of said connectors and the links, each of said fastener means defining a pivot axis for the respective link and the neighboring connector, and locking means for releas-

ably holding said links and the respective connectors against angular movement relative to each other, said turning means being disposed at said one side of said sheathing, each of said connectors comprising two locking portions which constitute component parts of the respective locking means and each of said locking portions comprising a set of first tooth-shaped projections, each of said links comprising two sets of second substantialy tooth-shaped projections and each set of second projections being movable into and from mesh with a set of first projections in each of a plurality of different angular positions of the respective links relative to the neighboring connectors, said sets of projections having arcuate shapes with centers of curvature located on or close to the respective pivot axes, each of said links having a central portion and first and



second end portions, said sets of second projections being provided on the end portions of the respective links and said end portions being movable, at least in part, relative to the respective central portions to thereby move said sets of second projections into and from mesh with the respective sets of first projections, each of said locking means further comprising means for arresting the end portions of said links in positions such that said sets of second projections mate with the respective sets of first projections, each of said end portions including a bolt mating with the respective central portion and a muff axially movable on the bolt and provided with the respective set of second projections, said arresting means comprising nuts meshing with the respective bolts and arranged to maintain the corresponding muffs in selected axial positions.

4,619,434

HEAT SENSITIVE MOTOR VALVE JACK

David E. Snyder, and Billy R. Bruton, both of Longview, Tex., assignors to Axelson, Inc., Longview, Tex.

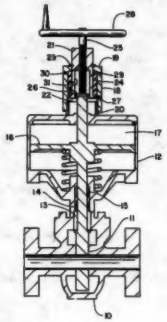
Filed Feb. 17, 1981, Ser. No. 235,102
Int. Cl.[4] F16K *31/00*
U.S. Cl. 251—14 **9 Claims**

1. A heat sensitive jack for overriding a motor valve including a valve body and a gate valve member connected to a valve stem movable outwardly with respect to said valve body by pressure within said valve body which is operated to move inwardly by a linear actuator having an actuator body and an actuator stem connected to the valve stem and extending outwardly of the actuator body, said heat sensitive jack being operable to move and hold said actuator stem inwardly but to allow said actuator stem to move outwardly in elevated temperature conditions without producing hazardous projectiles, which comprises:

a cylindrical cap connectable to said actuator body said cap including a radially inwardly extending shoulder facing axially toward said actuator body when said cap is connected to said actuator body;

a nut axially movably disposed in said cap said nut including a radially outwardly extending flange facing toward said shoulder of said cap and movable between a first position and a second position, wherein the distance between said first and second positions is at least as great as the distance of inward and outward travel of said actuator stem, whereby said flange of said nut remains within said cap in said second position;

a fusible element positioned between said shoulder and flange to transmit forces therebetween for normally maintaining said nut in said first position and melting when the



temperature exceeds a certain temperature allowing said nut to move to said position within said cap;

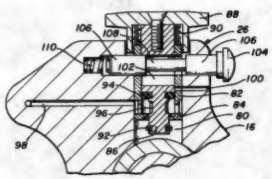
and a jack screw threadably engaged in and axially movable with rspect to said nut and adapted to be moved into abuttment with said stem when said cap is connected to said actuator body to jack said stem toward said open position.

4,619,435

CONTROL VALVE APPARATUS FOR PNEUMATIC TOOLS

Paul A. Biek, Houston, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Mar. 4, 1985, Ser. No. 707,925
Int. Cl.[4] F16K *31/143*
U.S. Cl. 251—25 **5 Claims**



1. Control valve apparatus for use with tools having a pneumatic motor therein, said valve apparatus comprising:

a valve housing:

a flow valve member located in a flow passageway in said housing, said valve member being moveable toward and away from a valve seat in said housing encircling said flow passageway preventing and permitting flow therethrough, respectively, to said motor;

a control valve member moveably located in a bore in said housing and extending loosely through an annular seat encircling said bore, said control valve member carrying spaced first said second seal members and having a reduced size portion located between said seal members;

said housing having an air supply passageway extending from said flow passageway to said bore on one side of said annular seat, a first control passageway connected with said bore for supplying air to other portions of said tool, a second control passageway extending from said bore on

the other side of said annular seat to a chamber in said housing adjacent to said flow control valve member whereby pressure may be exerted thereon to open said flow passageway, and a vent passageway connected with said bore for venting air from said first and second control passageways; and,

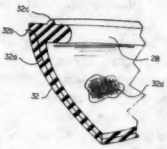
said control member being moveable from an open position wherein said second control passageway is open and said second seal member prevents flow through said vent passageway to a closed position wherein said first seal member engages said annular seat preventing flow from said supply passageway to said control passageways and said vent passageway is open, and to an override position wherein said reduced size portion is located adjacent to said seat for providing an excess of air flow to said second control passageway, said reduced size portion being located adjacent to said annular seat only when said control valve member is located in the override position.

4,619,436

CONTROL REGULATOR HAVING A FABRIC REINFORCED DIAPHRAGM

William J. Bonzer, and Gary L. Scott, both of Marshalltown, Iowa, assignors to Fisher Controls International, Inc., Marshalltown, Iowa

Filed Aug. 14, 1985, Ser. No. 765,489
Int. Cl.⁴ F16K *31/145*
U.S. Cl. 251—61.1 **11 Claims**



8. A rolling diaphragm regulator valve comprising:

a valve body defining a inlet and an outlet in axial alignment for mounting in a pipeline;

a baffle, interposed in said body between said inlet and said outlet, including a frustroconical portion defining a plurality of apertures;

a control chamber situated at right angles to said inlet and said outlet;

a diaphragm arranged for rolling and unrolling along the surface of said frustronconical portion, responsive to pressure in said control chamber, for progressively exposing and covering said apertures to regulate inlet to outlet flow, said diaphragm comprising a sandwich of a woven fabric reinforcement in a nitrile elastomer and being substantially nonstretchable;

an axially movable nose piece mounted in said control chamber behind said diaphragm;

spring means for urging said movable nose piece toward said diaphragm;

indicator means operable by movement of said nose piece for visually displaying an indication of the position of said valve; and

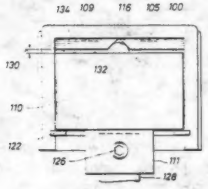
means exposing at least portions of said fabric to said flow for enabling release of any entrained gases in said diaphragm.

4,619,437

ADJUSTABLE TORQUE LIMITING VALVE HANDLE

William J. Williams, 395 Mulberry St., Vider, Tex. 77662, and Richard E. Purkey, Rte. 3, Box 151A, Kirbyville, Tex. 77956

Continuation-in-part of Ser. No. 797,750, Nov. 12, 1985, abandoned, which is a continuation of Ser. No. 581,068, Feb. 17, 1984, abandoned. This application Jan. 29, 1986, Ser. No. 823,670
Int. Cl.⁴ F16K *31/44*
U.S. Cl. 251—81 **8 Claims**



3. An adjustable torque limiting handle for rotating the stem of a valve to open and close the valve, comprising:

a cylindrical body adapted for mounting on the valve stem with the longitudinal axis of the body coinciding with the axis of rotation of the stem, said body having an outside end surface transverse to said rotation axis, said body further including a longitudinally extending blind bore opening into said outside end surface at a location radially spaced apart from said axis of rotation;

a housing having a cup-shaped cavity for receiving said cylindrical body and having an inside transverse surface spaced apart from said outside transverse surface of said body, said inside transverse surface of said housing having a plurality of depressions concentrically positioned with respect to said rotation axis and radially aligned with said longitudinal bore in said body, said housing further including a rim adapted for manual engagement;

a ball carried at least partially within said bore in said body;

a spring mounted in said bore underneath said ball for urging said ball outwardly into engagement with said housing depressions;

means mounted in said bore for adjusting the force exerted by said spring to said ball;

said housing and body rotating in unison when a torque is applied to the rim of said housing below a predetermined level;

said housing rotating independently of said body when a torque above said predetermined level is applied;

manual pressure on said housing in an axial direction compressing said spring as permitted by the space between said outside end surface of said body and said inside surface of said housing to cause increased torque between said housing and said body to permit rotation of said body even in the presence of a torque above said predetermined level prior to the application of such axial manual pressure.

4,619,438

VALVE

Ronald A. Coffee, Haslemere, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Aug. 19, 1980, Ser. No. 179,438
Claims priority, application Ireland, Sep. 10, 1979, 1711/79; United Kingdom, Mar. 20, 1980, 8009499
Int. Cl.⁴ F16K *31/02*
U.S. Cl. 251—129.01 **4 Claims**

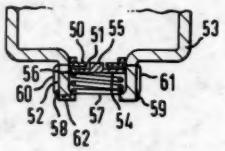
1. A valve comprising:

means defining a port for the passage of fluid;

an electrostatically neutral plug for interrupting the flow of fluid through the port;

means for mechanically biasing said plug into a position

closing the port, seating on said means defining the port, said means defining said port comprising a first metal plate having a port formed thereon, and said plug comprising a second metal plate, insulated from said first metal plate, and having a boss upstanding from one face of said second metal plate and dimensioned to be received within the port; and



means for applying a high electrostatic potential of the same sign to both said plug and said means defining the port, so that an electrostatic field between said plug and said means defining the port sufficient to cause said plug to move away from and open the port, and allow fluid passage therethrough, is provided.

4,619,439

LIFTING AND DEPOSITING DEVICE FOR PORTABLE CONTAINERS, COMPARTMENTS, CONTAINERS, SHELTERS OR THE LIKE

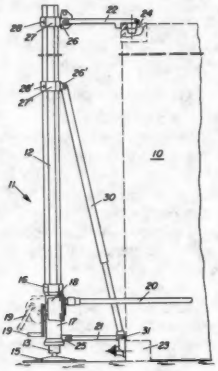
Reinhold Riedl, Miltenberg, and Conrad Lazarus, Freudenberg, both of Fed. Rep. of Germany, assignors to Haacon Hebetechnik GmbH, Freudenberg, Fed. Rep. of Germany

Filed Feb. 17, 1984, Ser. No. 581,200

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1983, 3305847

Int. Cl.⁴ B66F *7/26*

U.S. Cl. 254—45 **2 Claims**



1. Lifting and depositing apparatus for a transportable container, with rack jacks to be attached to the corners of the container by means of crossbars, wherein each rack jack comprises a tubular winch shank and a tubular support that is axially movable therein, a lifting jack part secured to said winch shank and having said tubular support slidably mounted therein, said lifting jack part having a length that is only a fraction of a height of the container, and a jack gearing mounted on said lifting jack part, characterized in that said lifting jack part guiding said support is a guide tube located at a bottom end of said tubular winch shank said winch being approximately the same height as the container, said guide tube being provided on its interior with a plurality of axially extending guide surfaces for the support which are interrupted by lengthwise grooves, said support having a rack thereon, said guide tube having a lengthwise recess on its interior for receiving the rack therein with slight play, said guide surfaces extending only through short axial peripheral areas at top and bottom ends of said guide tube, said guide tube being reinforced over on axial length of said guide surfaces, and said support having an exterior shape such that it does not extend into said lengthwise grooves.

4,619,440

FENCING DEVICE, A STAKE, A FASTENER AND AN ASSEMBLY PART FOR SUCH A DEVICE

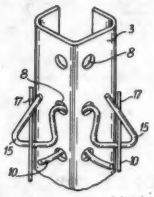
Patrick D. Thévenin; Bernard C. Gissinger, and Stéphane J. Thévenin, all of 08800, Monthermé , France

Filed Feb. 1, 1984, Ser. No. 575,883

Claims priority, application France, Feb. 2, 1983, 83 01608

Int. Cl.⁴ E04H *17/00*

U.S. Cl. 256—47 **12 Claims**



1. Apparatus for constructing a fence of the type having a generally horiztonal wire, comprising:

an elongate stake for supporting the fence wire, said stake having a generally hollow cross-sectional profile, said stake further having at least two perforations, said perforations being disposed one above the other and between two vertical planes tangent to vertically extending edges of said stake, said planes being parallel to the direction of said wire; and

a fastener adapted to fasten said generally horizontal wire to said stake, said fastener comprising a first portion in the shape of a loop for attaching said fastener into said stake perforations, a second horizontal portion connected at one end to an end of said first portion for supporting said wire when said fence apparatus is assembled, said second portion having a length such that a second end of said second portion opposite said first portion extends outside one of said vertical planes when said first portion is attached into said perforations of said stake, and a third portion connected to said second end of said second portion for securing said wire to said stake, said third portion having a free end bent upwardly and back toward the fastener first portion so that said free end is located between one of said vertical planes and a third vertical plane passing through the center of said stake and also parallel to said first two vertical planes, when said fastener is assembled into said perforations.

4,619,441

SHAFT FURNACE HAVING A METAL SHELL, A REFRACTORY LINING AND COOLING BODIES PROJECTING THROUGH THE SHELL INTO THE LINING

Jacob Felthuis, Oudorp; Jacobus Van Laar, Santpoort, and Jacob Rengersen, Sint-Pancras, all of Netherlands, assignors to Hoogovens Groep B.V., IJmuiden, Netherlands

Filed Apr. 2, 1984, Ser. No. 595,682

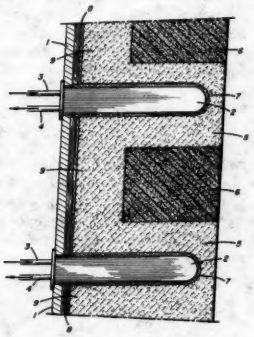
Claims priority, application Netherlands, Apr. 1, 1983, 8301178

Int. Cl.⁴ C21B *7/10*

U.S. Cl. 266—193 **10 Claims**

1. A shaft furnace having a metal shell, a refractory lining on the interior side of the shell and cooling bodies which project

inwardly through the shell into the lining and through which in operation cooling liquid flows, the lining, at least adjacent each of the cooling bodies, consisting of a refractory material with a coefficient of thermal conductivity (λ-value) of at least 10 kcal/mh°C. determined at 20° C. there further being provided, between the cooling bodies and the refractory lining a



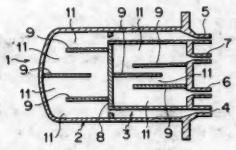
first thin layer of refractory material in contact with the bodies and the refractory lining and between the shell and the refractory lining a second thin layer of refractory material in contact with the shell and the refractory lining, said thin layers of refractory material having in each case a λ-value of less than 5 kcal/mh°C. determined at 20° C.

4,619,442

COOLING BOX FOR STEEL MAKING FURNACES

Michinori Hattori, Fukuyama, and Kazunori Niiya, Fukuyasu, both of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 613,966, May 24, 1984, abandoned. This application Jun. 10, 1985, Ser. No. 742,657
Claims priority, application Japan, May 26, 1983, 58-91503
Int. Cl.[4] F27D *1/12*
U.S. Cl. 266—193 **1 Claim**



1. A cooling box for steel making furnace, comprising

a first cooling chamber comprising a first outer wall, a second outer wall having an inner surface and an outer surface, a third outer wall having an inner surface and an outer surface, a fourth outer wall having an inner surface and an outer surface, a first inner wall, a pair of second inner walls, a first inlet and a first outlet, wherein said first outer wall is connected with said furnace, said second and third outer walls extend into said furnace and said fourth outer wall forms an end of said first cooling chamber within said furnace, said pair of second inner walls are connected to and extend from said first outer wall toward said fourth outer wall, and said first inner wall is connected to and extends from said inner surface of said fourth outer wall toward said first outer wall and is disposed between said pair of second inner walls, said first inlet is formed in said first outer wall and is disposed between said inner surface of said second outer wall and one of said pair of second inner walls, and said first outlet is formed in said first outer wall and is disposed between said inner surface of said third outer wall and the other of said pair of second inner walls;

wherein a first coolant applied through said first inlet flows between said inner surface of said second outer wall and said one of said pair of second inner walls, then between said inner surface of said fourth outer wall and an unconnected end of said one of said pair of second inner walls, then between said one of said pair of second inner walls and said first inner wall, then between said first outer wall and an unconnected end of said first inner wall, then between said other of said pair of second inner walls and said first inner wall, then between said inner surface of said fourth outer wall and an unconnected end of said other of said pair of second inner walls, then between said other of said pair of second inner walls and said inner surface of said third outer wall, and then through said first outlet;

a second cooling chamber surrounding said first cooling chamber within said furnace and comprising a first outer wall, a second outer wall, a third outer wall, a fourth outer wall, a first inner wall, a pair of second inner walls, said outer surfaces of said second, third and fourth outer walls of said first cooling chamber, a second inlet, and a second outlet, wherein said first outer wall is in contact with said furnace, said second inlet and said second outlet are respectively formed in said first outer wall, said second outer wall is disposed outside of said second outer wall of said first cooling chamber and forms with said outer surface of said second outer wall of said first cooling chamber a first passageway connecting said second inlet to said second cooling chamber, said third outer wall is disposed outside of said third outer wall of said first cooling chamber and forms with said outer surface of said third outer wall of said first cooling chamber a second passageway connecting said second outlet to said second cooling chamber, said fourth outer wall of said first cooling chamber forming a common partition between said first and second cooling chambers with said inner surface thereof facing said first cooling chamber and said outer surface thereof facing said second cooling chamber, said first inner wall is connected to and extends from said fourth outer wall toward said outer surface of said fourth outer wall of said first cooling chamber, said pair of second inner walls are connected to and extend from said outer surface of said fourth outer wall of said first cooling chamber toward said fourth outer wall, with said first inner wall being disposed between said pair of second inner walls;

wherein a second coolant applied through said second inlet flows through said first passageway, then between said second outer wall and one of said pair of second inner walls, then between said fourth outer wall and an unconnected end of said one of said pair of second inner walls, then between said first inner wall and said one of said pair of second inner walls, then between said outer surface of said fourth outer wall of said first cooling chamber and an unconnected end of said first inner wall, then between said first inner wall and the other of said pair of inner walls, then between said fourth outer wall and an unconnected end of said other of said pair of second inner walls, then between said other of said pair of second inner walls and said third outer wall, and then through said second passageway, and then through said second outlet;

wherein said second coolant is supplied to said second cooling chamber at a higher volume rate than said first coolant is supplied to said first cooling chamber;

wherein said second, third and fourth outer walls of said second chamber are deteriorated first upon exposure to the inside of said furnace without affecting flow of first coolant in said first cooling chamber; and

wherein said fourth outer wall of said first cooling chamber is disposed to be $\frac{1}{4}$ to $\frac{3}{4}$ the distance between said first outer

wall of said second cooling chamber and said fourth wall of said second cooling chamber.

4,619,443

GAS DISTRIBUTING TUNDISH BARRIER

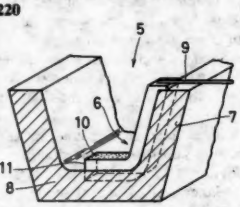
George K. Mitchell, Randfontein, South Africa, assignor to Rand Steel Technology [Proprietary] Limited, Randfontein, South Africa

Filed Oct. 2, 1984, Ser. No. 657,061

Claims priority, application South Africa, Oct. 6, 1983, 83/7463

Int. Cl.[4] C21C 5/48

U.S. Cl. 266—220 **6 Claims**



1. A tundish having at least one cast dam, and located in use, between the tundish walls at the lower part thereof so that it protrudes from the tundish floor; the dam having gas distributing means operatively connected to at least one pipe for conveying a supply of gas to the tundish; the gas-distributing means including a plurality of ducts formed in the body of the dam during casting thereof, and extending from the pipe to at least one dam surface which becomes exposed to molten metal during use of the tundish, the dam having an opening for drainage.

4,619,444

ARRANGEMENT FOR PREVENTING AIR FROM REACHING ABUTTING SLIDING SURFACES OF ROTARY SLIDING CLOSURE UNIT

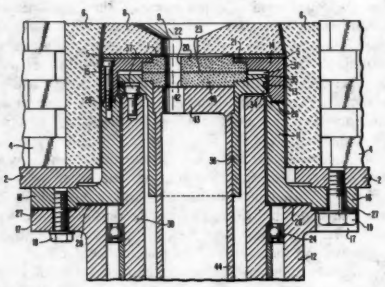
Herbert Bachmann, Lucerne, and Karl-Otto Hornung, Hombrechtikon, both of Switzerland, assignors to Stopinc Aktiengesellschaft, Baar, Switzerland

Filed May 13, 1985, Ser. No. 733,575

Claims priority, application Switzerland, May 23, 1984, 2533/84

Int. Cl.[4] B22D 41/08

U.S. Cl. 266—236 **8 Claims**



1. In a rotary sliding closure unit for controlling the discharge of molten metal from a metallurgical vessel, said unit being of the type including a stationary refractory member having a discharge opening, fixed mounting means for supporting said stationary refractory member at a position with said discharge opening adapted to be in alignment with an outlet of a metallurgical vessel, a rotary refractory member having a discharge opening, and rotary mounting means for supporting said rotary refractory member in abutment with said stationary refractory member along respective complementary abutting sliding surfaces and for rotating said rotary refractory member with respect to said stationary refractory member between an open position whereat said discharge openings are in alignment and a closed position whereat said discharge openings are out of alignment, the improvement comprising means for preventing air from contacting said abutting sliding surfaces of said stationary and rotary refractory members, said preventing means comprising:

said fixed and rotary mounting means defining therebetween an annular gap radially surrounding said abutting sliding surfaces; and

compressible seal means positioned at a location spaced from said abutting sliding surfaces and bearing against said fixed and rotary mounting means for sealing said annular gap and thereby defining a closed annular chamber radially surrounding said abutting sliding surfaces and isolated from exterior air.

4,619,445

SPRING UNIT

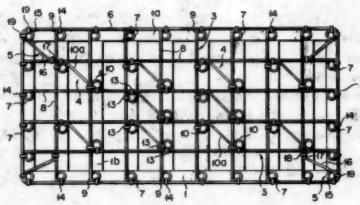
Noboru Sasaki, Tokyo, Japan, assignor to France Bed Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 493,330, May 10, 1983, abandoned. This application May 7, 1985, Ser. No. 731,604

Claims priority, application Japan, May 29, 1982, 57-92009; Feb. 22, 1983, 58-28230

Int. Cl.[4] F16F 3/04

U.S. Cl. 267—100 **5 Claims**



1. A spring unit, comprising:

a base plate including a first rectangular frame and parallel cross pieces, said frame having a periphery;

a second rectangular frame disposed parallel to the base plate;

a plurality of main springs, each having a first linear connecting rod portion, two first cylindrical spiral coil spring portions interconnected by said linear portion, and first straight portions substantially perpendicular to said linear portion and formed between said linear portion and each spiral coil spring portion, all integrally formed from a single length of wire, such that one end of each of said two first cylindrical spiral coil spring portions is connected to a corresponding one of two ends of said first linear connecting rod portion with a corresponding straight portion interposed perpendicularly therebetween, said plurality of main springs being disposed on the periphery of said first rectangular frame such that a first plurality of said first linear connecting rod portions are substantially at right angles to a second plurality of said first linear connecting rod portions and thereby form a matrix;

first fastening means fastening the other end of each of said first cylindrical spiral coil spring portions to the periphery of said first rectangular frame;

first clip means tightly fixing said second rectangular frame to the first straight portion at said one end of each of said first coil spring portions;

a plurality of intermediate support springs, each having a second linear connecting rod portion, two second spring portions, and second straight portions formed between said second linear portion and each second spring portion such that one end of each of said two second spring portions is connected to a corresponding one of two ends of said second linear connecting rod portion with a corresponding second straight portion interposed therebetween, each of said second linear connecting rod portions being shorter than each of said first linear connecting rod portions, and said plurality of intermediate support springs being disposed on said cross pieces of said first rectangular frame so that the two second spring portions of each intermediate spring are at diagonally opposite corners of intersections of said matrix;

second clip means tightly fixing the second straight portions at one end of each of said second spring portions to intersecting ones of said first linear connecting rod portions at said intersections of said matrix;

second fastening means fastening the other end of each of said second spring portions to said cross pieces of said first rectangular frame;

a plurality of corner springs, each corner spring being integrally formed from a single length of wire and being arranged between respective corners of said first and said second rectangular frames, each of said corner springs comprising a third spring portion having two ends, and a third linear connecting rod portion formed integrally with one end of said third spring portion, said third linear connecting rod portion having a free end bent at a given angle relative to the remainder of said third linear connecting rod portion to form a third straight portion extending integrally from said third linear connecting rod portion;

third fastening means fastening the other end of each of said third spring portions to a corresponding corner of said first rectangular frame;

fourth fastening means fastening each of said third spring portions to a corresponding corner of said second rectangular frame in the vicinity of said one end of each of said third spring portions; and

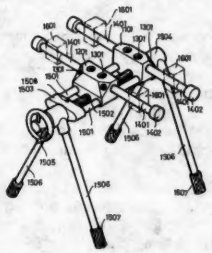
third clip means tightly fixing said third straight portion of each said corner spring to a first linear connecting rod portion of an associated main spring such that said third connecting rod portion extends at a given angle relative to said first linear connecting rod portion to which it is fixed.

4,619,446

ADJUSTABLE SUPPORT ARM-TYPE THREE-DIMENSIONAL WORK BENCH

Tai-Her Yang, 5-1, Tai-Pin St., Si-Hu Town, Dzan-Hwa, Taiwan

Filed Jan. 2, 1985, Ser. No. 688,441
Int. Cl.[4] B25B *1/02*
U.S. Cl. 269—88 **3 Claims**



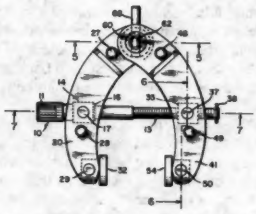
1. In a workbench, the combination of a frame including guide rail means, leg means on the frame for elevating the guide rail means to a workbench height, a fixed jaw mounted on the guide rail means, a movable jaw carried on the guide rail means, means for moving the movable jaw on the guide rail means towards and away from the fixed jaw, respectively, each of the jaws having a plurality of faces including at least one chamfered face, each of the faces being provided with respective recesses therein, respective elongated support rods adapted to be removably mounted in selected recesses in the jaws and projecting therefrom, whereby the respective rods may be disposed parallel or transversely to each other, a clamping block means on at least one of the rods and slidably adjustable thereon, means for securing the clamping block means in its desired adjusted position on the rod, and the clamping block means including a pair of clamps, and screw-threaded means carried by one of the clamps for moving the clamps towards and away from one another in a direction parallel to the rod, whereby variously shaped workpieces may be clamped within the workbench, and whereby the workbench has increased flexibility and versatility.

4,619,447

CLAMPING DEVICE

John B. Blake, P.O. Box 63, Park Ridge, N.J. 07656

Filed Oct. 3, 1985, Ser. No. 783,655
Int. Cl.[4] B25B *1/06*; ~~A44B~~ *21/00*
U.S. Cl. 269—221 **14 Claims**



1. A clamping device for gripping a workpiece or workpieces between pivotally-retained clamp pads disposed at the distal ends of a pair of pivotally-retained arms, this clamping device including:

(a) a pair of C-shaped arm assemblies pivotally retained at one end and at the other end of each arm assembly having a pivotally-retained pressure clamp pad, each arm assembly of two substantially alike plate-like members of metal arranged and maintained in spaced array by spacer and securing means, and at the pivotally-retained end these arms are disposed to be in overlaid condition, and in each plate there is formed an aperture, with the apertures disposed for axial alignment;

(b) a pivot cam disposed at and retaining one end of the C-shaped arms, this pivot cam formed with two eccentric cam surfaces sized to be engaged with each of the apertured surfaces of the two plate-like members of only one of the pair of arms and with the intermediate portion of the pivot cam having an enlarged portion sized to be slideably retained between the smallest distance between plate-like members when in overlaid condition, the mounted pivot cam having its axis normal to the C-shaped arms;

(c) a trunnion block pivotally carried between said plate-like members in each arm, each trunnion block intermediate the extent of the C-shaped arm assemblies and each block disposed to be a precisely equal distance from the axis of the mounted pivot cam, one trunnion block having threads formed therein and the other trunnion block having a smooth bore therethrough, each trunnion block having means for pivotally mounting each block in the arm structure;

(d) a threaded cap screw having a head member adapted for rotative manipulation and having a shank portion with a

threaded end portion, with these threads compatible with the threads in the threaded trunnion block, and limiting means for longitudinal retention of the cap screw in that trunnion block having a smooth bore and the threads on the cap screw compatible in the threads formed in the threaded trunnion block, said cap screw when and as mounted in said trunnion blocks providing an adjusting means and a force member that brings the pressure clamp pads toward and away from each other;

(e) a first spacer retainer having an enlarged midportion of a determined size and length so as to establish and maintain the plate-like members of a first arm in spaced array, and means for securing this retainer at a precise location and distance from the axis of the pivot cam;

(f) a second spacer retainer having an enlarged midportion of a size like that provided by the first spacer retainer, this second spacer retainer having a length so as to establish and maintain the plate-like members of this other clamp arm is spaced array, and means for securing this second spacer retainer at a precise location and distance from the axis of the pivot cam, the first and second spacer retainers so positioned that their axes establish a theoretical line therebetween so as to be always parallel to a theoretical line through the pivot axes of the trunnion blocks, said first and second spacer retainers and their precise location at a like distance from the axis of the pivot cam;

(g) another pair of spacer retainers, each having enlarged midportions, one spacer retainer positioned in said first arm assembly adjacent a trunnion block, and another similar spacer retainer positioned in the other arm assembly and also adjacent the trunnion block in said other arm assembly, each spacer retainer disposed between the plate-like members so as to establish and maintain the desired spacing, and

(h) a stop pin fixedly secured in the enlarged portion of the pivot cam and of sufficient length so that the stop pin as it is swung in an arc is limited by said first or second spacer retainers, this stop pin being secured so that when the stop pin engages one of the spacer retainers, the cam surfaces formed on the pivot cam engage the apertures in that arm assembly disposed to be actuated by the eccentric cam, the maximum throw of the arm assembly moving the pressure clamp pads closer together and, when the stop pin is moved to the other limit, the clamp pads are moved away from each other.

4,619,448

STOP MECHANISM, PARTICULARLY FOR STAMPLING MACHINES

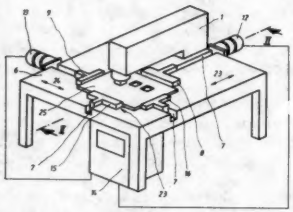
Berthold Leibinger, Gerlingen, and Eugen Herb, Ditzingen, both of Fed. Rep. of Germany, assignors to Trumpf GmbH & Co., Ditzengen, Fed. Rep. of Germany

Filed Mar. 11, 1983, Ser. No. 474,438

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1982, 3208989

Int. Cl.[4] B23Q *3/00*

U.S. Cl. 269—303 **4 Claims**



1. A machine tool having a workpiece clamping and moving assembly for moving a workpiece in a horizontal plane and comprising:

A. a horizontal table having X and Y axes prependicular to each other;

B. first and second workpiece guide assemblies each including a first stop member supported on said table for reciprocal movement along an axis of said table and means for clamping an associated workpiece against each respective first stop member for movement therewith in the same direction as said stop member during its reciprocal movement, said clamping means of each guide assembly including a second stop member supported on said table for relative movement towards and away from the respective first stop member of the respective guide assembly independently of any movment of the first stop member thereof, and means to effect movement of said second stop member toward said respective first stop member to clamp the associated workpiece therebetween, said first stop member and clamping means of said first guide assembly being movable along said X-axis and said first stop member and said clamping means of said second guide assembly being movable along said Y-axis;

C. first and second drive means for said first stop members of said first and second guide assemblies respectively for effecting reciprocal movement thereof along said X and Y axes, said reciprocal movement of each of said first stop members producing concurrent reciprocal movement of an associated workpiece and concurrent reciprocal movement of the associated clamping means of that guide assembly to thereby effect controlled movement of an associated workpiece along said X and Y axes; and

D. control means for said first and second drive means for effecting operation thereof independently of each other.

4,619,449

FOLDING APPARATUS FOR FOLDING SUPERPOSED MULTIPLE WEBS

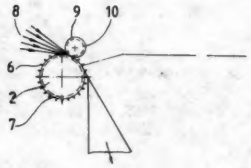
Hermann Fischer, Augsburg, Fed. Rep. of Germany, assignor to M.A.N.-Roland Druckmaschinen Aktiengesellschaft, Offenbach am Main, Fed. Rep. of Germany

Continuation of Ser. No. 677,171, Dec. 3, 1984, abandoned. This application Jan. 7, 1986, Ser. No. 817,156

Claims priority, application Fed. Rep. of Germany, Dec. 31, 1983, 3347715

Int. Cl.[4] B41F *13/58*

U.S. Cl. 270—5 **14 Claims**



1. For combination with a rotary printing machine having a machine drive and supplying a plurality of running, superposed webs (8),

a folding apparatus having

a folding triangle or folding former (1);

a pull-off means (5) located downstream of an end zone of the folding triangle or folding member (1); and the combination of

a supply roller (2), driven at machine speed by the machine drive of said printing machine, positioned adjacent, upstream—in the direction of run of the webs—of a beginning zone of the folding triangle or folding former, the plurality of webs (8) being guided to run over said supply roller (2)

with means for preventing unequal feeding rates among superposed webs subjected to unequal tractive force from said driven roller (2), and consequent buckling, creasing,

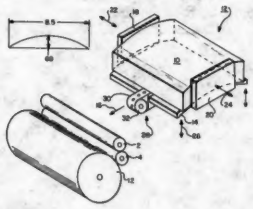
and tearing of said webs, said means comprising a plurality of engagement projections (6) extending radially outwardly from the circumference of the supply roller (2) located staggered about the circumference of the supply roller and having lengths sufficient for perforation through the superposed webs running over the supply roller (2).

4,619,450

COPYING APPARATUS WITH AUTOMATIC BOTTOM FEEDER

Carl P. Anderson, Menlo Park, and Edward F. Mayer, San Jose, both of Calif., assignors to Ricoh Systems, Inc., San Jose, Calif. and Ricoh Company, Ltd., Tokyo, Japan

Filed May 10, 1985, Ser. No. 732,608
Int. Cl.[4] B65H *3/04*
U.S. Cl. 271—35 **21 Claims**



1. In an electrophotographic apparatus designed to make successive copies utilizing a stack of copy paper utilizing a feeding arrangement configured to act on the stack in a way which successively moves pieces of paper off the bottom of the stack when the latter is placed in a feed tray, the paper feed assembly comprising

means for imparting a curvature to the stack of paper,

a pair of holding clamps arranged on either side of the feed tray facing the feed tray to hold said stack of copy paper in its curved position, said holding claims comprising a pair of plates, one on each side of said paper stack, said plates being movable into and out of engagement with the sides of said paper stack to hold said stack of copy paper in its curved position.

means for causing relative movement between the copy paper stack and the feed tray to allow withdrawal of the bottom sheet of copy paper, and

means for withdrawing the bottom sheet of copy paper while the feed tray is at a distance from the paper stack.

4,619,451

DRIVE ROLLER BIASING MECHANISM

Dennis W. Dodge, Amherst, N.H., assignor to Itek Corporation, Lexington, Mass.

Filed Oct. 31, 1984, Ser. No. 666,946
Int. Cl.[4] B65H *5/06*
U.S. Cl. 271—274 **27 Claims**

1. A mechanism for establishing individually adjustable roller bite bias pressures between paper drive roller means mounted upon a frame and a corresponding plurality of pinch rollers, shiftable with respect to said frame, comprising:

biasing link means having a first portion rotatably mounted upon said frame by a first pivot means;

a plurality of roller support means actuated by said biasing link means, each rotatably supporting one of said pinch rollers;

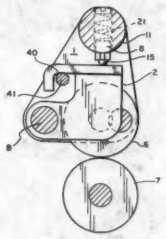
roller biasing isolation means for independently coupling each roller support means to said frame;

handle link means having a first portion thereof pivotably coupled to said frame by a second pivot means;

coupling link means having a first portion thereof rotatably coupled to a second portion of said handle link means by a third pivot means and having a second portion thereof coupled to a second portion of said biasing link means by a fourth pivot means;

a plurality of mechanical biasing means for asserting forces upon said pinch roller support means;

means for coupling said mechanical biasing means to said biasing link means for causing said pinch rollers to press against said drive roller means while producing a torque



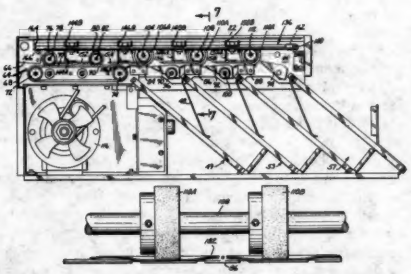
tending to rotate said roller position control link means about said second pivot means in a first direction for maintaining said handle link means in the closed position and for producing rotation of said handle link means about said second pivot means in a second direction opposite said first direction upon opening said mechanism to enable full separation of said pinch rollers from said drive roller means.

4,619,452

PHOTOGRAPHIC PRINT SORTER

Charles L. Euteneuer, St. Michael, and Robert E. Diesch, Rogers, both of Minn., assignors to Pako Corporation, Minneapolis, Minn.

Filed Jun. 21, 1984, Ser. No. 623,098
Int. Cl.[4] B65H *5/16, 29/62*
U.S. Cl. 271—305 **7 Claims**



1. A photographic print sorter having a conveyor path which includes a series of print drive stages for driving individual photographic prints in a longitudinal direction and having movable deflectors positioned between the print drive stages for selectively deflecting prints into print collecting trays, each print drive stage comprising:

a print slide having a top surface having a pair of recesses, the top surface supporting the prints as they are driven;

a drive shaft positioned above the top surface and the recesses, the drive shaft defining an axis of rotation which is parallel to the top surface and which extends in a transverse direction; and

a pair of drive rollers mounted on the drive shaft for rotation about the axis, the drive rollers being positioned to extend

into the recesses to form an interference fit between the rollers, the print slide and each photographic print as the photographic print is driven over the top surface of the print slide by the drive rollers.

4,619,453

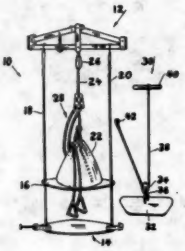
EXERCISE DEVICE

Lawrence H. C. Plumridge, 7 Arthur Wright Road, Fish Hoek, 7975, South Africa

Filed Nov. 1, 1984, Ser. No. 667,418

Int. Cl.[4] A63B *21/06*

U.S. Cl. 272—117 **11 Claims**



1. An exercise device, said device comprising:

(a) a head attachment structure comprising first and second spaced engaging members for engaging respective vertical posts of a door frame, a connection link for connecting the first and second spaced engaging members together, a pair of suspension links each having a first and second end, the suspension links being connected together at their first ends, and each suspension link being connected at the second end thereof to one of the first and second engaging members, the combined length of the pair of suspension links being greater than the length of the connection link;

(b) a weight member comprising a bag for receiving removable weight units;

(c) an elongated flexible member attached at one end to the weight member and at the other end being attachable to the handle;

(d) a support member, attached to the suspension links proximate their first ends, and having means for guiding the flexible member such that when the flexible member is pulled to provide lifting of the weight member, a force is exerted by means of the support member on the pair of suspension links for urging the engaging members outwardly towards the vertical posts of a door frame to which the head attachment structure is fitted;

(e) at least one elongated guide member connected at one end to the head attachment structure;

(f) locating means for connecting said at least one guide member to a vertical post of a door frame at a location remote from the head attachment structure; and

(g) a stabilizing member which is guided by said at least one guide member in a vertical direction and which is connected to the weight member.

4,619,454

LEG CONDITIONER FOR LEG SPLIT TYPE EXERCISE

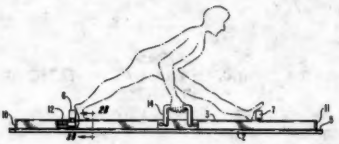
Ronald A. Walton, 4207 Byers St., Capitol Heights, Md. 20743

Filed May 30, 1985, Ser. No. 739,097

Int. Cl.[4] A63B *21/00*

U.S. Cl. 272—141 **8 Claims**

1. A leg conditioner for use by a person performing a leg split type exercise with the legs spread apart and the body in a position above the legs comprising a frame, a pair of upstanding foot braces, means mounting said foot braces on said frame so that relative movement between said foot braces can be effected by a person performing said leg split type exercise with the fee pressed against the respective foot braces, said frame having a length sufficient to allow a person to spread the foot braces apart on the frame with the persons feet pressed against the respective foot braces during a leg exercise so that



the person can attain a full or nearly full leg split exercising position, handle means arranged on said frame between said foot braces for said person to grip when performing said leg split type exercise, and means for yieldably resisting the spreading apart of the foot braces.

4,619,455

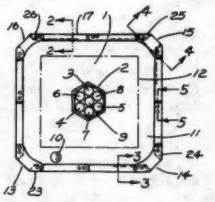
GAME APPARATUS

Azeez A. Quraishi, 549 Harley Dr., Apt. No. 6, Columbus, Ohio 43202

Filed Nov. 16, 1984, Ser. No. 672,063

Int. Cl.[4] A63D *3/00*

U.S. Cl. 273—118 R **3 Claims**



1. An enclosure for a game involving balls within the enclosure comprising,

at least four side rails joined together to form a rectangular enclosure with at least four corners; each rail including a lower surface to rest on a floor, an upper surface remote from said floor a distance greater than one-half the diameter of balls used in the enclosure, and an inner surface extending between and joined to the upper and lower surfaces,

a rebound surface attached to each said rail and projecting inwardly from said rail to (1) engage balls impacting on the rail and (2) absorb the impact by deflection and rebound, said rebound surface being configured to engage the ball at its horizontal center line,

each rail having an end terminating adjacent a corner,

each corner including two rail ends spaced from each other and said two rails ends being oriented such that they are not aligned linearly, the spacing between the rail ends defining a passage for balls, each rail end having at least two apertures in its upper surface,

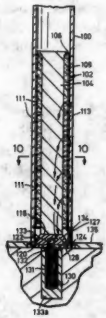
a cross member bridging across the space between the rail ends at each corner, each said cross member being spaced upwardly from the floor a distance greater than the diameter of the balls,

at least four pins projecting downwardly from each said cross member into said apertures, at least two said pins projecting into at least two apertures in each rail end to thereby hold the rails against relative rotation or horizontal movement.

4,619,456
MAGNETIC RETENTION OF HOCKEY GOALS

Dennis Meggs, Waterloo, Canada, assignor to Dennis Meggs Enterprises Limited, Ayr, Canada

Filed Apr. 11, 1984, Ser. No. 599,287
Claims priority, application United Kingdom, Apr. 26, 1983, 8311312
Int. Cl.[4] A63B *63/00*
U.S. Cl. 273—127 B 15 Claims



15. In combination:

a hollow hockey goal post in the form of a ferromagnetic pipe with an open bottom end,

a keeper secured to the ice, the keeper having a raised central portion adapted for insertion within the open bottom end of the ferromagnetic pipe, and a frusto-conical portion surrounding the raised central portion, and

a cylindrical canister within said pipe, the canister having means defining a ferromagnetic flux path within the canister and including the keeper, the canister incorporating means sustaining a closed magnetic ciruit passing through the means defining the ferromagnetic flux path within the canister, the keeper, and the ferromagnetic pipe.

4,619,457
BINGO GAME INVOLVING PROMOTIONAL COUPONS

Maynard E. Small, 105 Ward Pkwy. Apt. 507, Kansas City, Mo. 64112

Continuation-in-part of Ser. No. 385,840, Jun. 7, 1982, Pat. No. 4,509,759, which is a continuation-in-part of Ser. No. 273,259, Jun. 12, 1981, Pat. No. 4,342,457, which is a continuation of Ser. No. 79,189, Sep. 26, 1979, Pat. No. 4,285,520. This application Feb. 7, 1985, Ser. No. 699,311
Int. Cl.[4] A63F *3/06*
U.S. Cl. 273—269 2 Claims

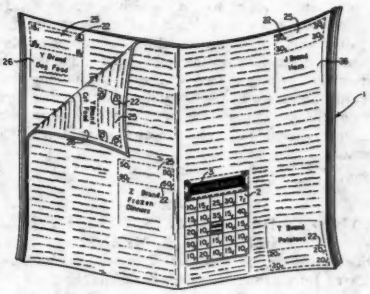
1. A game of the type known as "bingo" for players comprising:

(a) a single edition printed run-of-press, multi-page and mass circulation publication;

(b) a set of playing cards, one of said set of cards being provided with each copy of said publication, each of said cards having a grid with several rows and columns forming set of patterned areas, each patterned area respectively bearing individual area indicia thereon;

(c) a set of coupons common to all players printed in said publication, at least a portion of said coupons being positioned at various isolated locations throughout the pages of the publication as to be spaced apart from one another by printed subject matter unrelated thereto, each coupon respectively bearing individual coupon indicia, whereby every player has an identical set of coupon indicia bearing coupons; at least a portion of said coupons being interspersed throughout said publication with unrelated printed material therebetween;

(d) said area indicia and said coupon indicia being cooperatively related, in that selected indicia from the coupon indicia set are matched area indicia with selected indicia from the area indicia set such that said matched area indicia describe a predetermined pattern on said playing card grid; whereby each player is urged to scan each page of said publication to determine the presence of said coupons in order to produce said predetermined pattern of matched area indicia; and wherein:

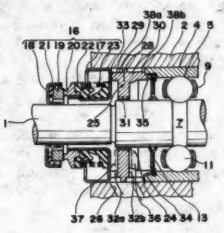


(e) said set of playing cards comprises a first portion of playing cards and a second portion of playing cards, said playing card set first and second portions each include a predetermined pattern of matched area indicia; said predetermined patterns of said matched area indicia of respective first and second playing card portions are dissimilar to each other; and said predetermined patterns of said matched indicia on all playing cards within a particular one of said portions are similar.

4,619,458
FLUID-TIGHT SHAFT MOUNTING WITH LEAKAGE DRAINAGE MEANS

Mititosi Mitumaru, Kashiwara, Japan, assignor to Koyo Seiko Company Limited, Osaka, Japan

Filed Dec. 30, 1985, Ser. No. 814,372
Claims priority, application Japan, Oct. 15, 1985, 60-230704
Int. Cl.[4] F16J *15/38*
U.S. Cl. 277—24 3 Claims



1. A fluid-tight shaft mounting for rotatably and fluid-tightly supporting a shaft member having one end rigidly mounted with a driven element, which comprises:

a generally tubular housing through which the shaft member extends;

a sealed bearing assembly positioned within the housing and exteriorly around the shaft member for the support of the shaft member relative to the housing;

an axial-mechanical face seal assembly interposed between the driven element and the sealed bearing assembly, and exteriorly around the shaft member;

said housing having at least one passage defined therein for communicating a space, between the bearing assembly

and the face seal assembly, with the outside of the housing; and

an annular partition member disposed within the housing around the shaft member so as to divide the space between the bearing assembly and the face seal assembly into first and second annular chambers adjacent the bearing assembly and the face seal assembly, said partition member comprising an annular radial body having its outer periphery formed with first and second axial flanges that protrude perpendicular to the radial body in opposite directions away from each other and terminate in abutment respectively with a portion of the bearing assembly and a portion of the face seal assembly, said radial body having its inner peripheral face spacedly surrounding the shaft member and formed with guide grooves, said first and second axial flanges having respective passage means defined therein in fluid-connected relationship with the passage in the housing.

4,619,459

CYLINDER HEAD GASKETS WITH APERTURE REINFORCING MEANS

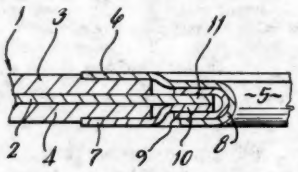
Maurice G. Herrington, Furnham Common, England, assignor to Payen International Limited, Berkshire, England

Filed Dec. 5, 1984, Ser. No. 678,758

Claims priority, application United Kingdom, Dec. 8, 1983, 8332855

Int. Cl.⁴ F16J *15/12*

U.S. Cl. 277—235 B **3 Claims**



1. A gasket comprising a flat body portion comprising two gasket facings and an inner reinforcing core, the gasket having an aperture at the inner edge of the centrally located reinforcing core defined therein, said aperture being provided with secondary sealing means comprising flat annuli located on opposite faces of the body portion in those regions there of surrounding and adjacent the aperture, the annuli extending into the aperture to provide annular primary sealing means radially inwardly of the margin of the aperture, wherein one of said annuli is folded around radially outwardly of the aperture to at least partially enclose, locate and retain a primary sealing ring radially inwardly of and relative to the margin of the aperture, said primary sealing ring comprising marginal portions of both of said annuli and co-operating portion of said reinforcing core which projects radially inwardly of the aperture from said flat body portion.

4,619,460

HAMMER-DRILL CHUCK

Günter H. Röhm, Heinrich-Röhm-Strasse 50, 7927 Sontheim, Fed. Rep. of Germany

Filed Mar. 21, 1984, Ser. No. 591,975

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 8308926[U]; Apr. 29, 1983, 3315661[U]

Int. Cl.⁴ B23B *31/04*

U.S. Cl. 279—19 **10 Claims**

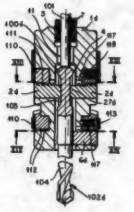
1. In combination with

a hammer drill having a drive spindle rotatable about a spindle axis and a hammer displaceable axially in the drive spindle; and

a drill bit having a shaft extending along a shaft axis and having a plurality of radially outwardly open and at least generally axially extending grooves, a chuck comprising:

a generally tubular chuck body centered on a chuck axis and having a central axially extending passage, the body normally being fixed on the spindle against movement angularly, axially, or radially relative thereto and spacedly receiving the shaft of the drill bit in its passage with the spindle, shaft, and chuck axes all coaxial, the hammer projecting axially forward into the passage and being engageable therein with the bit;

a plurality of centering jaws radially but not angularly or axially displaceable in the chuck body and having inner ends radially engageable with the drill-bit shaft offset from the grooves;



a plurality of coupling jaws radially but not angularly or axially displaceable in the chuck body and axially offset from the centering jaws, the coupling jaws having formations complementarily engageable in the grooves of the drill bit; and

respective guiding and coupling actuating means connected to the jaws for moving same radially synchronously and thereby centering the bit in the body by engagement of the inner ends of the centering jaws with the shaft and for engaging the formations of the coupling jaws in the grooves for rotationally linking the body and bit while permitting limited relative axial movement between the bit and the body.

4,619,461

HAMMER DRILL APPARATUS

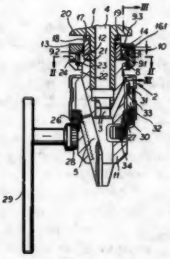
Günter H. Röhm, Heinrich-Röhm-Strasse 50, D-7927 Sontheim, Fed. Rep. of Germany

Filed Apr. 4, 1985, Ser. No. 719,760

Claims priority, application Fed. Rep. of Germany, May 8, 1984, 3416946

Int. Cl.⁴ B23B *31/08*

U.S. Cl. 279—19.3 **11 Claims**



1. In a hammer drill apparatus comprising a drill chuck driven by a drill spindle, said drill spindle being hollow and having an axial passage through which a hammer stroke of a ram passing through the spindle is transmitted to an end of a drill bit held between centrally adjustable clamp jaws in said

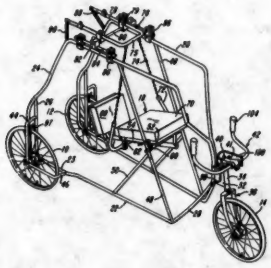
drill chuck, and wherein a plurality of catches are provided for mounting of said drill chuck on said drill spindle so as to prevent rotation of said drill chuck relative to said drill spindle, but to allow axial play of said drill chuck on said drill spindle unless said axial play is prevented by a shift member adjustably mounted on said drill chuck, the improvement wherein said catches are radially protruding lugs rigidly connected with said drill spindle, said lugs lying axially opposite a plurality of shift surfaces on opposite sides of said drill chuck, and in one rotary position of said shift member said lugs are locked in close contact with said shift surfaces so as to prevent said axial play of said drill chuck on said drill spindle, and in another rotary position of said shift member said lugs are positioned with clearance from said shift surfaces so as to allow said axial play.

4,619,462

CYCLE APPARATUS HAVING THERAPEUTIC AND UTILITY ASPECTS

Don T. Shaffer, 5968 Culzean Dr., Apts. 1620, Trotwood, Ohio 45426, and Emmert Milyard, Box 11, Brookville, Ohio 45309

Filed Jun. 7, 1984, Ser. No. 618,193
Int. Cl.⁴ B62M *1/14*; B62L *1/00*; A61H *3/00*; A63B *21/00*
U.S. Cl. 280—242 R **22 Claims**



14. A cycle type structure including a frame, frame mounted means for supporting the body of a person so that the person's lower extremities may be in a freely dependent relation to the supporting means and extending toward an approaching relation to a frame underlying surface and means connecting said supporting means to said frame for a dynamic balancing of the supported person whereby the person's lower extremities have limited non-load bearing contact with a frame underlying surface.

4,619,463

UNIVERSAL ADJUSTMENT HITCH

Robert C. Weaver, R.D. #1, Port Matilda, Pa. 16870

Filed Jul. 18, 1985, Ser. No. 756,383
Int. Cl.⁴ B60S *9/04*
U.S. Cl. 280—475 **7 Claims**

1. On a towed power broom, said power broom having a wheel supported rear element and an attaching element coupled to and supported by said wheel supported rear element; an adjustable hitching device, comprising in combination:

pivoting means connected to said attaching element;

a tow bar connected to said pivoting means;

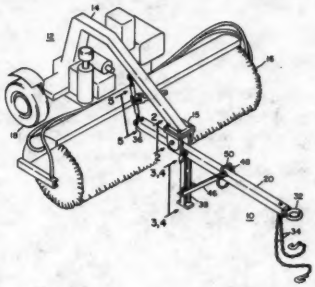
an adjusting device pivotally connected between said tow bar and said attaching element;

a foldable supporting device pivotally connected to said tow bar, adapted to support said tow bar in an approximate horizontal position; said supporting device comprising in combination:

a stand member pivotally attached to said tow bar and extending to ground support;

a stand support member pivotally attached to said stand member;

a hand grip attached to said stand support member and in sliding contact with said tow bar;



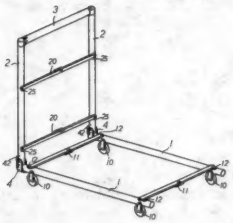
removable locking device, movable between a support locking position in which said locking device secures said stand support member to said tow bar and stowed locking position in which said locking device secures said supporting device in a folded inoperative position.

4,619,464

PORTABLE TYPE OF FOLDABLE LUGGAGE CART

Philip Hwang, 6A, 261 Nanking E. Rd., Sec. 3, Taipei, Taiwan

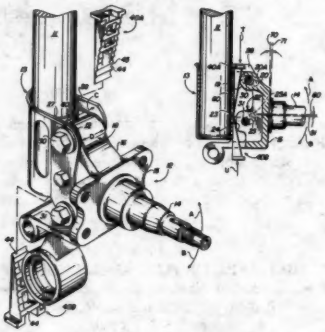
Filed May 21, 1985, Ser. No. 736,610
Int. Cl.⁴ B62B *3/02*
U.S. Cl. 280—655 **1 Claim**



1. A portable and foldable luggage cart comprising a pair of track rods, each track rod having a plurality of casters, a pair of vertical rods, means on one end of each of said track rods for pivotally mounting one end of one of said vertical rods to said one end of said each track rods, a handle pivotally connected at one of its ends to the free end of one of said vertical rods and having a projection at the other of its ends for engagement in a slot in the free end of the other of said vertical rods when said luggage cart is unfolded and erected for carrying luggage, hinged joints interconnecting said pair of track rods and said pair of vertical rods for spacing one of said track rods and vertical rods parallel to the other of said track and vertical rods when said hinged joints are opened for said cart to carry luggage, and for bringing said one and said other of said tracks together substantially close and parallel with each other when said hinged joints are closed for folding said cart, said pivotally mounting means on one end of each of said tracks having an open upward U-shaped end having a first pin extending through an elongated slot in said vertical rod, a second pin for engaging a slot in the end of said vertical rod when said vertical rod is perpendicular to said track rod, said open upward U-shaped end having a rear wall for engaging the slotted end of said vertical rod when said vertical rod is folded and for

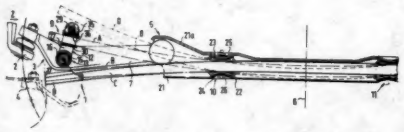
engaging the side of said rod when said slot is in engagement with said second pin, and a spring connected at one of its ends to said mounting means and at its other end to said vertical rod for engaging the slotted end of said vertical rod with said rear wall of said open U-shaped end when said vertical rod is folded and for engaging said slot in the end of said vertical wall with said second pin when said vertical rod is perpendicular to said track rod.

4,619,465
SHIM FOR ADJUSTING CAMBER
Robert D. Johnson, 2562 Trevino Pl., Mesa, Ariz. 85205
Filed Dec. 31, 1984, Ser. No. 687,916
Int. Cl.[4] B62D *17/00*
U.S. Cl. 280—661 **1 Claim**



1. A method for adjusting the camber of a wheel carried by the suspension assembly of a vehicle, said suspension assembly including
an elongate vertically disposed strut,
a spindle including
a base,
an elongate member attached to said base and projecting outwardly therefrom and shaped and dimensioned to rotatably carry said wheel,
an upper arm attached to said base and projecting rearwardly therefrom and including
a distal end having an arcuate outer surface
an elongate aperture formed therethrough,
a lower arm attached to said base and projecting rearwardly therefrom and including
a distal end having an arcuate outer surface,
an elongate aperture formed therethrough,
means for interconnecting said spindle and said strut, said interconnecting means being connected to said strut and including an upper aperture and a lower aperture formed therethrough,
a first spindle securing bolt extending through said upper aperture of said interconnecting means and said elongate aperture of said upper arm,
a second spindle securing bolt extending through said lower aperture of said interconnecting means and said elongate aperture of said lower arm,
one of said spindle securing bolts having a cross-sectional area less than the cross-sectional area of at least one of said aperture formed through said interconnecting means to receive said one of said spindle securing bolts, and
said elongate aperture formed through one of said lower and upper arms to receive said one of said spindle securing bolts,
said interconnecting means being shaped and dimensioned such that said spindle securing bolts can maintain said spindle in position with respect to said strut with said arcuate outer surfaces of said spindle arms spaced away from said strut,
said method comprising the steps of
(a) removing said wheel from said spindle;
(b) loosening said spindle securing bolts;
(c) pivoting said spindle a desired amount about the other of said spindle securing bolts;
(d) inserting a wedge-shaped shim between said strut and said arm carrying said one of said spindle securing bolts, said shim including
(i) an elongate rear surface contacting said strut and having a longitudinal axis, and
(ii) a front surface angled with respect to said rear surface and having a plurality of parallel arcuate grooves perpendicular to said longitudinal axis of said rear surface, one of said arcuate grooves being contacted by said arcuate outer surface of said arm having said elongate aperture to receive said one of said spindle securing bolts;
(e) tightening said spindle securing bolts; and,
(f) mounting said wheel on said spindle.

4,619,466
WHEEL SUSPENSION
Walter Schaible, Hemmingen, and Peter Mast, Ehningen, both of Fed. Rep. of Germany, assignors to Dr. Ing. h.c.F. Porsche AG, Fed. Rep. of Germany
Filed Sep. 24, 1984, Ser. No. 653,776
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334623
Int. Cl.[4] B60G *11/08, 3/06*
U.S. Cl. 280—669 **29 Claims**



17. A wheel suspension in which wheel carriers of mutually oppositely disposed wheels are connected each with a guide member which is pivotally connected at a relatively fixed part so as to be displaceable in the generally vertical direction, and in which the guide member of each wheel is operatively connected with the free end of a leaf spring means that extends substantially transversely to the vehicle longitudinal axis and is supported at the fixed part, and in which said leaf spring means, in addition to its function as wheel spring, also serves as stabilizer, comprising guide arm means operatively connecting the free ends of the leaf spring means with the guide members at a distance to the latter, elastic bearing support means for retaining the guide arm means so as to be relatively movable and pivotal with respect to the guide members, and clamping means at the ends of the guide arm means opposite the elastic bearing support means for clampingly fastening the leaf spring means,
wherein the guide members are formed by cross guide members,
in which the relatively fixed part is part of the vehicle body which includes a bearer means, and wherein the center area of the leaf spring means is elastically clamped-in between two bearing support means, said bearing support means being arranged at said bearer means at a distance to the vehicle longitudinal axis,
wherein aid bearing support means include elements elastically surrounding the leaf spring means, and bearing shells arranged mutually oppositely and constructed of arcuate shape in the vehicle transverse direction for retaining therebetween the elastic elements,
wherein said bearer means includes walls which, within the center area of the bearing support means, have an arcuate

configuration in the transverse direction corresponding to the bearing shells and which form-lockingly receive the bearing shells, and

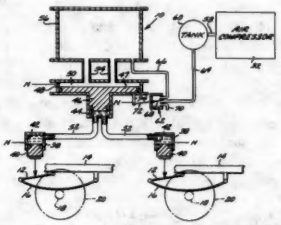
wherein the guide arm means extends generally vertically from the cross guide member, the leaf spring mens being held at its end of the free upper end of the guide arm means and this area of the leaf spring means assuming a position above the cross guide member.

4,619,467

VARIABLE RATE AIR SPRING APPARATUS FOR VEHICLE SUSPENSION

James W. Lafferty, 11122 Wright Rd., Lynwood, Calif. 90262

Filed Apr. 16, 1984, Ser. No. 600,949
Int. Cl.[4] B60G *11/26*
U.S. Cl. 280—708 **11 Claims**



1. In a vehicle having a frame, an axle, and suspension means coupling said axle to said frame for movement of said axle and said suspension means relative to said frame through a dynamic range during travel of the vehicle over a roadway, said dynamic range including a static position relative to said frame, determined by the static load on said axle and said suspension means when the vehicle is stopped, an improved air spring apparatus comprising:

inexpansible active air cylinder means defining air chamber means and having air piston means reciprocable therein from one side to the other of a neutral position to increase and decrease the pressure in said air chamber means, said active air cylinder means and said air piston means being operatively coupled in-series with said suspension means and said frame for reciprocating said air piston means responsive to said movement of said axle and said suspension means;

inactive air cylinder means located remote from and coupled in-series with said active air cylinder means, said axle and said suspension means, and including first conduit means providing fluid communication with said air chamber means sufficiently friction free that the pressures in said air chamber means and said inactive air cylinder means are substantially the same during reciprocation of said air piston means whereby said inactive air cylinder means thereby constitutes an air column extension of said active air chamber means;

a source of air under pressure;

second conduit means providing fluid communication between said source and said inactive air cylinder means; and

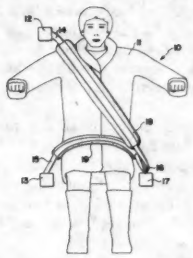
height control means for maintaining a predetermined location of said air piston means in said active air cylinder means, at a level operative to tend to locate said air piston means in said neutral position, and thereby tend to locate said axle and said suspension means in said static position.

4,619,468

COVER FOR A SEATBELT OF AN AUTOMOBILE

Horst Spill, 702 - 261 Queen St., Winnipeg, Manitoba, Canada R3J 3R1

Filed Jan. 22, 1985, Ser. No. 693,536
Int. Cl.[4] B60R *21/00*
U.S. Cl. 280—801 **3 Claims**



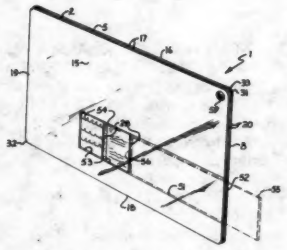
1. A combination of a seatbelt strap and a cover for the seatbelt strap of an automobile particularly for use with a fur coat worn by an occupant, the strap including means arranged to fasten around the occupant such that part of the strap contacts and restrains the occupant, the cover comprising an elongate flexible fabric rectangular layer having a length of the order of 24 to 27 inches, a central strip along the length thereof being formed from a natural fur pile fabric material having a width of the order of 2 inches for lying along one side of the strap, a first strip along one side of the central strip and a second strip along the other side thereof each being formed from a non-pile fabric material including along an edge thereof remote from the central strip one of a pair of cooperating fastening means the cover being wrapped around the strap to form a sleeve with the pile fabric inner-most for engaging the coat, whereby the only engagement of clothes of the occupant by said seatbelt is by said fur fabric.

4,619,469

CARD FOR MICROFILM AND METHOD OF FORMING SAME

Jerry D. Grover, 5406 Oliver, Kansas City, Kans. 66106

Filed Jul. 26, 1982, Ser. No. 401,636
Int. Cl.[4] B42D *15/00*; G09F *3/03*
U.S. Cl. 283—76 **21 Claims**



1. A card which comprises:

(a) a core having:

(1) a front surface;

(2) a back surface;

(3) a top edge;

(4) a bottom edge;

(5) a pair of opposite side edges; and

(6) an elongated cut-out open at one of said side edges and extending substantially parallel to said core top and

bottom edges, said cut-out terminating in a blind end in spaced relation from the other of said core side edges;

(b) transparent front and back panels thermally bonded to said core front and back surfaces respectively, each said panel having:

(1) a heat sensitive adhesive thereon for bonding said panel to said core;

(2) an area covering said cut-out; and

(3) a line of said adhesive extending transversely across said area and dividing said area into a pair of area subparts each free of said adhesive;

(4) said lines of adhesive being bonded together;

(c) an opaque cover attached to said back panel and including:

(1) a first portion covering said cut-out and being removable from said back panel;

(2) a second portion attached to said back panel; and

(3) said first and second portions being integrally connected and demarcated by a tear line, said cover first portion being removable from said cover second portion along said tear line; and

(d) a pocket formed by said cut-out between said front and back panels, said pocket being subdivided into a pair of discrete compartments with said adhesive lines bonding said panels together therebetween;

(e) said discrete compartments being adapted to receive at least one microfilm segment visible through said front panel with said cover first portion removed.

15. A method of forming a card which comprises the steps of:

(a) forming a core with an edge, a cut-out open at said edge and front and back surfaces;

(b) bonding a transparent front panel to said core front surface in covering relation to said cut-out;

(c) bonding a translucent back panel to said core back surface in covering relation to said cut-out;

(d) providing an opaque cover with first and second portions demarcated by a tear line whereby said cover first portion is removable from said cover second portion along said tear line;

(e) adhesively securing only said cover second portion to one of said panels;

(f) covering said cut-out with said cover first portion; and

wherein a pocket is defined by said cut-out between said front and back panels, said pocket being adapted to receive a microfilm segement visible through said front panel with said cover removed and accessible at said core edge.

4,619,470

FLANGE CONNECTION ASSEMBLY FOR FIBER-REINFORCED PLASTIC PIPE MEMBERS

Friedhelm Overath, Schaffhausen, and Remo Saner, Büsserach, both of Switzerland, assignors to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Filed Feb. 20, 1985, Ser. No. 703,331

Claims priority, application Switzerland, Feb. 20, 1984, 802/84

Int. Cl.[4] F16L *58/00*

U.S. Cl. 285—55 **8 Claims**

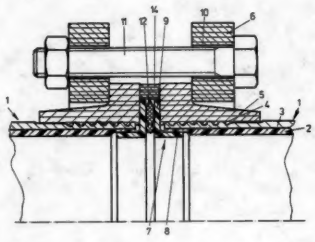
1. A flange connection assembly for fiber-reinforced plastic pipe members comprising:

a pair of pipe members joined together, said pipe members each comprising an inner pipe jacket consisting essentially of thermoplastic material and an outer pipe jacket consisting essentially of a fiber winding impregnated with a synthetic resin;

a threaded section consisting essentially of rounded threads formed in said outer pipe jacket at the end of each of said pipe members;

a flange bushing including a loose flange ring and having rounded threads formed on said bushing threadedly engaged on each of said threaded sections of said outer pipe jacket; and

a covering collar covering at least the end of each of said pipe members inserted at said inner pipe jacket, said covering collar consisting essentially of a cylindrical portion extending into engagement internally into said inner pipe jacket joined with said inner jacket by a bonded connection which is fluid tight;



said covering collar being fabricated of the same material as said inner pipe jacket and coextending in engagement therewith to at least partially overlap with said flange bushing;

said flange bushing consisting essentially of a fiber winding impregnated with synthetic resin and being solidly connected with said pipe members in said threaded section by means of a bonded connection.

4,619,471

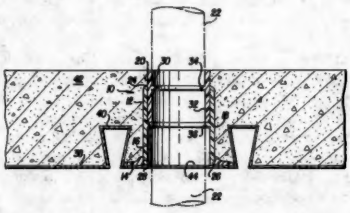
EMBEDDED PIPE COUPLING HOLDER

Gerold J. Harbeke, 2807 So. Military Trail, West Palm Beach, Fla. 33415

Filed Nov. 27, 1985, Ser. No. 802,277

Int. Cl.[4] F16L *5/00*

U.S. Cl. 285—158 **5 Claims**



1. A pipe coupling holder for holding a pipe coupling joint to be embedded in concrete to a concrete form, said pipe coupling joint having cylindrically-shaped external and internal surfaces, said internal surface including a ridge abutment therein for abutting against the ends of pipes coupled by said pipe coupling joint, said holder comprising:

an elongated, tubularly-shaped barrel member having a cylindrical inner wall of a size for snugly receiving the external surface of said pipe coupling joint at a first end of said barrel member for being engaged thereto, said barrel-member inner wall having a size that at all positions along the length of said barrel member is at least as great as the size of the inner surface of said pipe coupling joint, the outer wall of said barrel member having a fixed shape extending from an opposite second end thereof for a substantial distance along the length thereof toward said first end;

a flange member being separate from said barrel member but defining a flange hole therethrough of a size for snugly

receiving the fixed-shaped outer wall of said barrel member to be selectively adhered thereto at a selected position along said barrel member;

whereby second-end portions of said barrel member can be cut away to accommodate raised portions of a concrete form wall so that said second end can be brought into contact with an unraised portion of said form wall, the flange being slidable along the outer wall of said barrel member so that it can be placed on top of said raised portion of said concrete form wall, and said flange can be adhered at this position along said outer wall of said barrel portion and fastened to the raised portion of said concrete form wall to hold said pipe coupling holder and said pipe coupling joint in position while concrete is poured into said form.

4,619,472

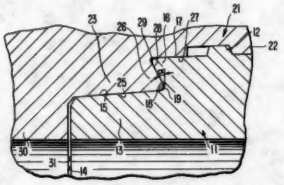
PIPE COUPLING

Haruo Kozono, and Isao Arakawa, both of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed May 2, 1985, Ser. No. 729,971

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—334 **5 Claims**



1. A pipe coupling, comprising:

an inner tubular member having

a cylindrical externally threadless external sealing portion terminating in a substantially free tip, said external sealing portion being tapered in a forward direction toward said tip,

external thread rearward of said external sealing portion, and

a threadless external peripheral shoulder, triangular in cross section, between said external thread and said external sealing portion, the exterior of said inner tubular member being threadless from said tip to said external thread, said external peripheral shoulder including a first unthreaded surface leading rearwardly to said external thread, and an inversely conical surface leading from said first unthreaded surface to an external sealing surface of said external sealing portion, defining an annular V-shaped groove between said external sealing surface and said inversely conical surface; and

an outer tubular member having

a threadless internal sealing portion fitted tightly on said external sealing portion,

internal thread rearward of said internal sealing portion, threadedly engaging said external thread, and

a threadless internal peripheral shoulder, triangular in cross section, between said internal thread and said internal sealing portion, the interior of said outer tubular member being threadless from said internal sealing portion to said internal thread, said internal peripheral shoulder including a second unthreaded surface leading rearwardly to said internal thread and a conical surface extending in a rearward and radially inward direction from a forward end of said second unthreaded surface to a rearward end of an internal sealing surface of said internal sealing portion so as to define an annular V-shaped groove between said second unthreaded surface and said conical surface, such that said external and internal peripheral shoulders respectively tightly fit in the V-shaped grooves of said inner and outer tubular members, whereby said external sealing portion is free of axial stress.

4,619,473

FLUID PASSAGE CONNECTOR FOR LIQUID CHROMATOGRAPH

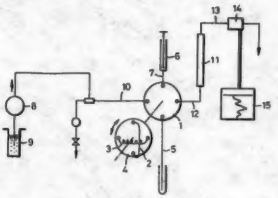
Noboru Someya, Chiba, Japan, assignor to Tokyo Rika Kikai Co., Ltd., Japan

Filed Apr. 16, 1984, Ser. No. 600,784

Claims priority, application Japan, Apr. 18, 1983, 58-68212

Int. Cl.⁴ F16L *25/00*

U.S. Cl. 285—353 **13 Claims**



1. A fluid passage connector for liquid chromatographs comprising a push bolt having a threaded portion at one end thereof and an axial hole therethrough; a tube extending through said axial hole, with the end of said tube extending through said hole, and proximate said threaded portion, being flat; a ferrule surrounding said tube near end thereof and abutting said one end of said push bolt; a cylindrical packing member having an axial recess at one end thereof terminating in a shoulder and having an axial passage therethrough; said end of said tube being seated in said axial recess against said shoulder; and a joint member having an axial opening therein terminating in a shoulder, at least a portion of the wall surrounding said opening distal from said last-mentioned shoulder being threaded, and an axial passage therethrough; said cylindrical packing member being seated in said axial opening against said last-mentioned shoulder; said threaded portion of said push bolt being inserted in said axial opening and threadedly engaged therewith; whereby a fluid-tight joint is produced.

4,619,474

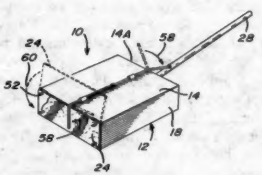
ASH-REMOVAL SHOVEL

Paul Yvan Dauphinais, 3625 Pacific Street, Saint-Hubert, Canada (J3Y 5K2)

Filed Sep. 17, 1985, Ser. No. 776,909

Int. Cl.⁴ A47F *13/08*

U.S. Cl. 294—9 **5 Claims**



1. A shovelling device for removing substantially all ashes from an ash-pit, comprising a box-like casing including top and bottom walls, two side walls, a rear wall, and a front flap door hingedly secured to said top wall; a handle bar outwardly projecting from said rear wall; a closure member, mounted on the outer face of the said top wall to releasably close by the outside said casing flap door, and consisting of a rod, including

an intermediate portion and front and rear bent end portions, and at least two longitudinally-spaced front and rear brackets fixedly secured to the outer face of said top wall and through which slidingly and rotatively engages said rod main portion; said rod rear end portion constituting a hand-actuated operating lever and said rod front end portion constituting a closure lever, the latter in its downwardly-oriented position being releasably positionable against the flap door to close same; a ring, fixedly secured to an intermediate section of said rod main portion; and a compression coil spring surrounding the rod intermediate section and extending in between said ring and said front bracket; whereby pushing said rod forwardly compresses said coil spring, by pushing said coil spring against said front bracket, said closure lever in its flap closing position being biased against said flap door by said coil spring to sealingly close said casing.

4,619,475

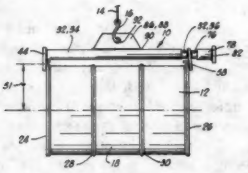
DRUM LIFTING APPARATUS

Lawrence E. Sylvest, II, Franklinton, La., assignor to Conoco Inc., Ponca City, Okla.

Filed Jun. 10, 1985, Ser. No. 742,984

Int. Cl.[4] B66C *1/42*

U.S. Cl. 294—90 **16 Claims**



1. An apparatus for lifting a drum which has a particular length, said apparatus comprising:

a lifting beam having first and second ends;

a fixed first flange fixedly attached to said first end of said beam and extending laterally therefrom and having a first drum lip engagement means extending from said first flange substantially parallel to said beam in a first direction from said first end toward said second end of said beam, for engaging a first annular lip on a first end of said drum;

said second end of said beam having a shoulder defined thereon facing in said first direction, a distance parallel to said lifting beam between said shoulder and an inner surface of said first flange being less than the length of said drum;

a threaded rod fixedly attached to said beam and extending in said first direction from said shoulder of said second end of said beam;

a releasable second flange having an opening therethrough through which said rod is loosely received, so that said second flange may slide on said rod and may engage said shoulder, said second flange extending laterally from said rod and having a second drum lip engagement means extending from said second flange in a second direction substantially opposite said first direction for engaging a second annular lip on a second end of said drum, said opening in said second flange having a sufficient clearance about said threaded rod that said second flange can be tilted away from a radially extending orientation relative to said threaded rod to facilitate engagement and disengagement of said second lip engaging means with said second annular lip;

a first threaded nut means threadedly engaged with said threaded rod on a side of said second flange opposite said shoulder of said lifting beam, for tightening said second flange against said second end of said drum; and

lifting eye means, fixedly attached to said lifting beam substantially midway between said first and second ends of said lifting beam, for engagement by a crane or the like for lifting said drum lifting apparatus and said drum.

4,619,476

EXPANDABLE STORAGE SYSTEMS FOR SMALL VEHICLES

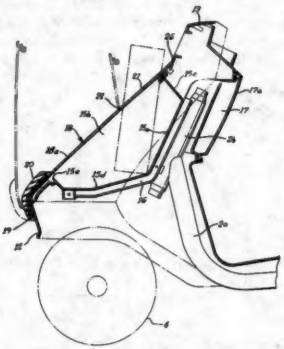
Katsuyoshi Kawasaki, Tokyo, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 459,482, Jan. 20, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 815,183

Claims priority, application Japan, Jan. 21, 1982, 57-7278[U]; Jan. 21, 1982, 57-7279[U]

Int. Cl.[4] B62J *7/06;* B60R *5/02;* B62D *25/12*

U.S. Cl. 296—37.1 **5 Claims**



1. A vehicle having a single steerable front wheel comprising a front fender extending about the front wheel, a leg shield having a contoured front exterior surface angled upward from ahead of the front wheel and walls extending rearwardly from said front exterior surface adjacent said front wheel, a storage compartment formed within the leg shield and above said front wheel, said front exterior surface of said leg shield forming a lid comprising a lower lid and an upper lid hinged together at adjacent edges, front bumper means positioned forward of said front wheel at the lower edge of said lower lid, said bumper means forming a lower hinge connecting said lower lid to said front fender for simultaneous pivoting of said upper and lower lids to an open position wherein said adjacent edges abut together, and cooperating closure means attached between the upper edge of said upper lid and said leg shield to retain said lid closed.

4,619,477

MOTOR VEHICLE DOOR INTERIOR LINING EQUIPPED WITH A STORAGE POCKET

Rudi Kneib; Ludwig Emmer, and Peter Robitschko, all of Sindelfingen, Fed. Rep. of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart, Fed. Rep. of Germany

Filed Mar. 5, 1985, Ser. No. 707,812

Claims priority, application Fed. Rep. of Germany, Mar. 9, 1984, 3408611

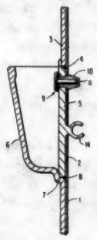
Int. Cl.[4] B60R *7/04*

U.S. Cl. 296—37.13 **11 Claims**

1. In a motor vehicle, a door interior lining having an assembly aperture and equipped with a storage pocket congruent therewith, comprising

a plate means forming a rear wall of the storage pocket and releasably fastened within said aperture,

at least one releasable fastening means for effecting removal of at least the plate means towards the interior of the



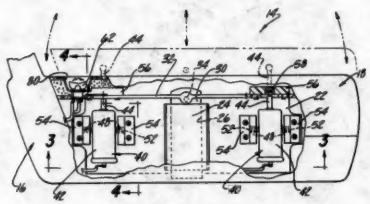
vehicle after release of said at least one fastening means to expose said assembly aperture.

4,619,478

POWERED ADJUSTABLE ARM REST

Paul Heimnick, Owosso, and LeRoy B. Johnson, Perry, both of Mich., assignors to Schmelzer Corporation, Flint, Mich.

Continuation-in-part of Ser. No. 572,660, Jan. 20, 1984. This application Aug. 26, 1985, Ser. No. 769,265
Int. Cl.[4] B60J 9/00
U.S. Cl. 296—153 20 Claims



1. A power-operated adjustable arm rest assembly adapted to be adjustably mounted on a relatively fixed structure for adjustment along a generally vertical plane, said arm rest assembly comprising:

a generally longitudinally-extending arm rest structure;

mounting means adapted to be fixedly secured to said fixed structure for mounting said arm rest structure thereon, said mounting means having an opening extending therethrough in a generally vertical direction;

support means for interconnecting said arm rest structure with said mounting means for both pivotal and generally translational adjustable movement relative to said mounting means in said generally vertical plane, said support means including a generally vertically-extending elongated support member vertically slidably received in said opening in said mounting means and pivotally interconnected with said arm rest structure for pivotal relative movement in said generally vertical plane;

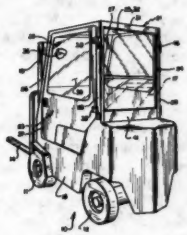
a pair of selectively actuable powered actuating means longitudinally spaced apart on opposite sides of said support means and interconnecting said arm rest structure and said mounting means for selectively urging said arm rest structure to, and for holding said arm rest structure in, preselected adjusted positions relative to said mounting means, said holding means being selectively actuable independently of one another to perform said urging and holding functions in order to allow both the pivotal and translational positions of said arm rest structure relative to said fixed structure to be adjusted independently.

4,619,479

LIFT TRUCK CAB

Robert P. Martin, Jr., 12576 Lake Ave., Lakewood, Ohio 44107

Filed Mar. 14, 1985, Ser. No. 711,972
Int. Cl.[4] B62D 33/06
U.S. Cl. 296—190 6 Claims



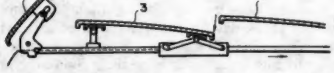
1. In combination, an industrial lift truck and a cab on the truck, the truck including a frame, an engine mounted on the frame, and components in the cab mounted on the frame, the cab comprising a roof structure for protecting the operator from falling objects, weather, airborne pollution, and the like, four generally upright corner members supporting the roof adjacent their upper ends and for attachment to the truck at their lower ends, a pair of said corner members being disposed adjacent the left and right front of the cab and another pair of said upright corner members being generally disposed adjacent the left and right rear of the cab, a transparent windshield supported on the front pair of upright corner members, left and right side walls supported on left and right ones of said upright corner members, respectively, a rear wall supported on the rear pair of corner members, the rear wall including an upper transparent panel and a lower panel, the lower panel being movably mounted relative to the upper panel between extended and retracted positions, guide means supported on said rear corner members for guiding said lower panel for movement between said extended and retracted positions, the retracted position being generally elevated relative to the extended position, said lower panel in its extended position cooperating with the upper panel to close off the zone between the rear pair of corner members and thereby exclude environmental intrusion, said components of the truck being movably mounted in the cab for access to the motor, said lower panel in its retracted position permitting said components of the truck to pass through the space of its extended position, and means on said cab for releasably holding said lower panel in its retracted position.

4,619,480

SUNROOF PANEL OPENING/CLOSING APPARATUS

Kichizo Motoyama, Tokyo, and Yoshiharu Araki, Ueda, both of Japan, assignors to Kabushiki Kaisha Johnan Seisakusho, Ueda and Aichi Machine Industry Co., Ltd., Nagoya, both of, Japan

Filed Sep. 28, 1984, Ser. No. 655,566
Claims priority, application Japan, Sep. 29, 1983, 58-181366
Int. Cl.[4] B60J 7/22, 7/053, 7/057, 7/185
U.S. Cl. 296—217 4 Claims



1. An apparatus for opening and/or closing a forward sunroof panel (2) and a rearward sunroof panel (3) both attached

to an aperture formed in a roof panel (1) of a vehicle body, which comprises:

(a) a motor (26);

(b) a pair of guide rails (20);

(c) a lefthand and a righthand geared wire (21), one wire arranged along each guide rail (20) disposed under the roof panel and driven by said motor in rearward and forward directions;

(d) a lefthand and a righthand forward panel tilting mechanism (100), one mechanism associated with each geared wire for tilting the forward sunroof panel front down to its open position when said geared wires are shifted by a first wire stroke by said motor and for tilting the forward sunroof panel to its closed position when said geared wires are reversely shifted by the first wire stroke by said motor, said tilting mechanisms each comprising a latch (101) and a detent lever (102), both pivotally supported by one of the guide rails, said latch being pivoted by a pin (105) fixed to one of said geared wires to a position at which the forward sunroof panel is tilted to its open position and then locked by said detent lever when said geared wires are shifted by said motor, said latch being disengaged from said detent lever by the pin (105) and then pivoted by the pin to the closed position when said geared wires are reversely shifted by said motor; and

(e) a lefthand and a righthand rearward panel sliding mechanism (200), one associated with each of said geared wires, for first lowering one end of the rearward sunroof panel and then shifting the rearward panel along and under the roof panel to its open position when said geared wires are further shifted

by said motor while keeping the forward sunroof panel open, and for first shifting the rearward sunroof panel from under the roof panel and then raising said one end of the rearward sunroof panel to its closed position when said geared wires are reversely shifted by said motor while keeping the forward sunroof panel open, each of said sliding mechanisms comprising outer, middle and inner telescopic brackets (202, 203, 204), the outer bracket of which is connected to one of said geared wires, and a pair of short and long link arms (201A, 201B) pivotally linked together to a rearward panel supporting member (23) at one end thereof and pivotally linked separately to said telescopic brackets at the other ends thereof; when said outer bracket is shifted by said geared wire , said two link arms being expanded by said telescopic brackets to a position at which the rearward panel supporting member is lowered and then subsequently shifted by said telescopic brackets along and under the roof panel to a position at which the rearward sunroof panel is opened; when said outer bracket is reversely shifted by said geared wire, said two link arms being shifted by said telescopic brackets from under the roof panel and then subsequently folded by said telescopic brackets to a position at which the rearward panel supporting member is raised or the rearward sunroof panel is closed.

4,619,481

INFLATABLE SEAT CUSHION ASSEMBLY

Charles A. Grudzinskas, 3990 McCabe Ave., NE., Ada, Mich. 49301

Continuation-in-part of Ser. No. 449,853, Dec. 15, 1982, abandoned. This application May 25, 1984, Ser. No. 614,270

Int. Cl.[4] A47C 7/42

U.S. Cl. 297—284 **11 Claims**

1. An inflatable seat cushion assembly, comprising:

a seat cushion having a plurality of inflatable compartments;

a manifold block having integrally formed therewith:

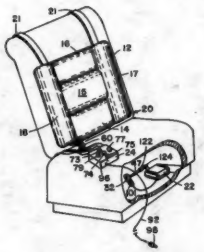
a connector conduit for each of said compartments, a first end of each connector conduit in fluid communication with an associated one of said compartments and each connector conduit having a second end,

said connector conduits formed by grooves in the exterior surface of said manifold block and a first cover plate disposed to cover said connector conduit grooves sealingly, said covered connector conduit grooves forming said connector conduits,

a pressure manifold with a common pressure inlet having means for connection to a pressurized fluid source and said pressure manifold having a lateral pressure outlet for each compartment, each lateral pressure outlet establishing fluid communication between said common pressure inlet and an associated one of said connector conduit second ends,

an exhaust manifold with exhaust outlet means for the common exhaust of spent fluid from said compartments and a lateral exhaust inlet for each said compartment, each lateral exhaust inlet establishing fluid communication between an associated one of said connector conduit second ends and said exhaust outlet means, said exhaust manifold being separate from said pressure manifold,

said lateral pressure outlets of said pressure manifold and said lateral exhaust inlets of said exhaust manifold formed by grooves in the exterior surface of said manifold block and a second cover plate disposed to cover said grooves sealingly, forming manifold conduits between said grooves and said second cover plate,



a fluid communication juncture formed at each of said connector conduit second ends between associated ones of said lateral pressure outlets, said lateral exhaust inlets and said connector conduits, and

a recess between each of said lateral outlets and its corresponding lateral inlet;

a control valve at each of said junctures and seated within said recess, wherein each control valve is selectively adjustable among an inflation position, an exhaust position and a closed position, where in said inflation positions said associated compartment communicates with said corresponding lateral pressure outlet through an associated connector conduit for inflating said compartment, where in said exhaust position said associated compartment communicates with said corresponding lateral exhaust inlet through an associated connector conduit for deflating said compartment through said exhaust outlet means, and where in said closed position fluid communication is prevented between said associated compartment and both the pressure source and said exhaust; and

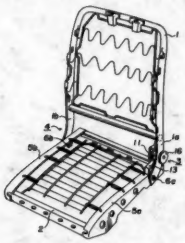
each said control valve having an actuator, and and aperture provided through one of said cover plates for each of said control valves through which said valve actuator passes for selectively adjusting said control valve.

4,619,482

RECLINING DEVICE FOR A VEHICLE SEAT

Noriyasu Itsuki, c/o Tachikawa Spring Co., Ltd., 2-12, Matubara-cho, 3-chome, Akishima-shi, Tokyo, Japan

Filed May 1, 1984, Ser. No. 605,914
Int. Cl.[4] B60N 1/06
U.S. Cl. 297—355 4 Claims



1. A reclining device for a vehicle seat including a back frame longitudinally rotatably journaled relative to a cushion frame, said reclining device comprising:

a cam having at least three working surfaces which differ from one another in amount of displacement, said cam is rotatably connected on one of said back frame and said cushion frame by a bracket member at a predetermined distance from a connecting point where said back frame is rotatably connected to said cushion frame, and said cam further having an arc-shaped guide groove perforated therein, the arc center of which is disposed cocentrically relative to the center of rotation of said cam, said arc-shaped guide groove having a plurality of recessed portions formed therein, each of said recessed portions arranged in a corresponding relationship with the respective working surfaces of said cam;

an elongated guide hole on said bracket member corresponding crosswise to said arcshaped guide groove of said cam;

a cam engagement portion provided in the other of said back frame and said cushion frame, said cam engagement portion positioned to engage with said cam;

a shaft, rotatably supported, extending through said arc-shaped guide groove and said elongated guide hole such that said shaft is slidable along said arc-shaped guide groove while at the same time slidable along said elongated guide hole in a cooperative manner, and, when said cam is rotated with one of said working surfaces thereof being brought into engagement with said cam engagement portion, said shaft is then biased by a spring means into engagement with one of said plurality of recessed portions corresponding to said one of said working surfaces; and

a hook means for retaining said cam into engagement with said cam engagement portion, said hook means rotatably mounted to said shaft and further at a tip end thereof engaged with a portion of said cam engagement portion.

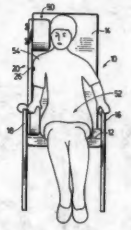
4,619,483

PHYSICALLY HANDICAPPED SHOULDER SUPPORT FOR ATTACHMENT TO A CHAIR BACK

Donna J. Dickey; Sebastian Dobler, both of Kingston, and Natalie Horejda, Regina, all of Canada, assignors to Her Majesty the Queen in right of Canada, as represented by the Minister of Health, Toronto, Canada

Filed Oct. 1, 1984, Ser. No. 656,365
Int. Cl.[4] A47C 1/10
U.S. Cl. 297—397 11 Claims

1. A chair comprising a seat, a back and opposing side arms, a shoulder support connected to a side of said back and extending outwardly of said back in the general direction of a corresponding side arm, a headrest mounted on said shoulder support and overlapping a portion of said back, means for mounting said headrest on said shoulder support to provide for vertical height adjustment of said headrest relative to said seat to accommodate varying shoulder heights of persons using said chair, said shoulder support having a rigid plate which extends downwardly and contacts an inner portion of said side arm, said rigid plate contacting said side arm to provide said means for maintaining said shoulder support in a shoulder supporting



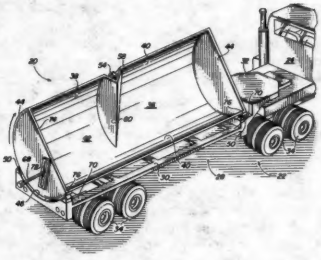
position, means for detachably connecting said shoulder support to said back, a hip bolster being provided along said side arm and said seat to space a person's hip from said side arm, a recessed area being defined below said headrest along said shoulder support and above said hip bolster to receive and support a shoulder of a person on said chair.

4,619,484

SIDE UNLOADING DUMP TRUCK

John H. Maxey, 5509 Oakdale Ave., Woodland Hills, Calif. 91364

Filed Sep. 17, 1984, Ser. No. 651,572
Int. Cl.[4] B60B 1/16
U.S. Cl. 298—18 13 Claims



1. An improved side unloading dump truck assembly, said assembly comprising, in combination:

(a) a dump truck, including a motor and a truck body comprising a generally horizontal frame supported on a plurality of rotatable wheels;

(b) a plurality of spaced rollers connected to said frame;

(c) a container bin having an open top and rotation preventing means secured thereto, said bin being supported on said rollers;

(d) an upwardly directed tilt link pivotally connected to one end of said frame and to said bin adjacent the upper end thereof;

(e) an upwardly directed ram pivotally connected to one side of said frame and to said bin at points remote from said link, whereby initial extension of said ram rotates said bin around its longitudinal axis on said frame rollers without lateral movement of said bin until further such rotation is prevented by said rotation preventing means, whereupon further extension of said ram lifts one side of said bin from said rollers, tilts and rotates said bin and

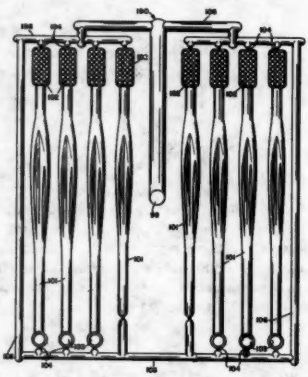
pivots said bin around the opposite side thereof on said rollers to effect side unloading of said bin.

4,619,485

METHOD OF MANUFACTURING FUSED BRUSHES

John C. Lewis, Jr., Forest Dale, Vt., assignor to Tucel Industries, Inc., Forest Dale, Vt.

Filed Mar. 8, 1985, Ser. No. 709,667
Int. Cl.[4] A46D *3/04*
U.S. Cl. 300—21 **6 Claims**



1. A method for producing, simultaneously, a plurality of integrally connected synthetic fused filament brush constructions comprising:

providing a thermoplastic injection molded frame in a predetermined configuration, and a plurality of thermoplastic substrate blocks integrally connected within said frame by a plurality of gate members extending between said blocks and frame;

supporting said frame and integrally connected blocks in a predetermined position;

providing a plurality of tuft pickers in a preselected design corresponding to the design of tufts to be fused to said substrate blocks, said pickers being arrayed to register a tuft design on each of said blocks in said frame;

picking a plurality of synthetic fiber tufts with said pickers whereby said tufts are contained within said pickers with the ends exposed;

simultaneoulsy fusing the ends of each of said tufts and heating the corresponding substrate blocks;

indexing said fused tuft ends into said substrate blocks until the ends fuse with said blocks whereby said blocks are simultaneously tufted with a plurality of synthetic filament tufts in a preselected array;

withdrawing said pickers from said tufts to provide a plurality of tufted substrate blocks integrally interconnected with each other by said frame, whereby said frame and resultant tufted blocks become a finished pre-assembly package for distribution.

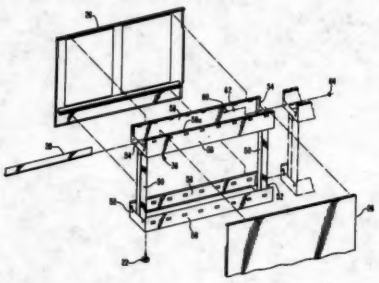
4,619,486

SPINE ASSEMBLY

Bruce R. Hannah, Cold Spring, N.Y.; David D. McClanahan, Landsdale, and Lee Denny, Quakertown, both of Pa., assignors to Knoll International, Inc., New York, N.Y.

Filed Jun. 8, 1984, Ser. No. 618,492
Int. Cl.[4] A47B *77/08*
U.S. Cl. 312—195 **15 Claims**

1. A spine system assembly comprising a plurality of housings joined end-to-end to create an interconnected network of such housings, each housing comprising a framework defined by vertical structural support members at each end of the housing, side support members joining together said vertical structural support members and providing support for spaced-apart parallel side panels, said vertical structural support members and said side support members lying totally within the



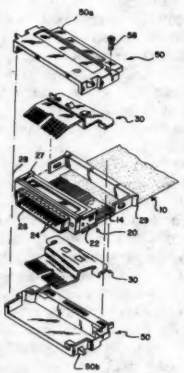
space between said side panels and said vertical structural support members being spaced from said side panels to permit the unimpeded laying of electrical wiring within each housing and from one housing to another.

4,619,487

FLAT CABLE CONNECTOR WITH GROUNDING CLIP

Robert W. Brush, Jr., North Brunswick, N.J., assignor to Thomas & Betts Corporation, Raritan, N.J.

Filed Sep. 28, 1984, Ser. No. 655,971
Int. Cl.[4] H01R *13/658, 9/07*
U.S. Cl. 339—14 R **8 Claims**



1. An electrical connector for terminating flat electrical cable having a plurality of conductors, an overlying conductive shield and an outer insulative jacket, said connector comprising:

an insulative housing for accommodating said cable;

a plurality of electrical contacts supported in said housing for electrical engagement with said conductors of said cable;

a conductive shell supporting said housing; and

a conductive element having a first extent for engagement with the conductive shield of said cable and a second extent engageable with the conductive shell for providing electrical continuity between said shield and said shell, said second extent of said conductive element further including a plurality of integrally formed fingers extending into contact with said shell, said fingers providing

plural parallel electrical paths between said conductive element and said shell.

4,619,488

CONNECTION ARRANGEMENT FOR AN ELECTRICALLY SCREENED SLEEVE

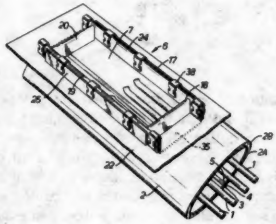
Sidney H. Martin, Mellor, Great Britain, assignor to International Computers Limited, London, England

Filed Feb. 15, 1985, Ser. No. 702,350

Claims priority, application United Kingdom, Feb. 21, 1984, 8404479

Int. Cl.[4] H01R *4/66*

U.S. Cl. 339—14 R **8 Claims**



1. A connection arrangement including; a screened sleeve having a wall comprising an outer electrically insulating layer and an inner electrically conductive screening layer; electrically conductive members secured to open flaps formed in the wall so that electrical connections are produced between the conductive members and the inner layer, the conductive members forming a frame bounding an aperture left in the wall by the open flaps; and a connection plate of conductive material having an aperture therein arranged to receive the frame; the arrangement being such as to enable electrical cables housed within the sleeve to be passed through the aperture in the wall of the sleeve and the connection plate when the frame is positioned in the connection plate.

4,619,489

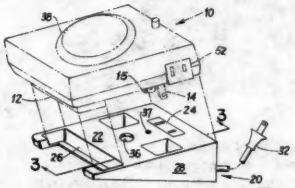
ADAPTOR FOR AN ELECTRIC TIMER

Harold Hinkens, Manitowoc, Wis., assignor to AMF Incorporated, White Plains, N.Y.

Filed Aug. 2, 1984, Ser. No. 636,881

Int. Cl.[4] H01R *11/00*

U.S. Cl. 339—28 **3 Claims**



1. An adaptor for supporting an electric timer which plugs into a polarized wall outlet in a utility position on a table comprising:

(a) a bottom surface and a top surface extending at an angle from one end of the bottom surface;

(b) a polarized electrical receptical on said top surface for receiving the timer plug;

(c) means for electrically connecting said receptacle to an electrical source in a polarized relationship; and

(d) means for giving access to the bottom surface of a timer when said timer is plugged into the adaptor.

4,619,490

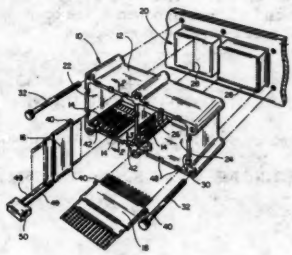
GUIDANCE AND RETENTION DEVICE AND CONNECTOR ASSEMBLY

Robert M. Hawkings, San Mateo, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Dec. 18, 1984, Ser. No. 683,757

Int. Cl.[4] H01R *29/00*

U.S. Cl. 339—31 M **20 Claims**



1. A guidance and retention device comprising:

a housing having an opening therethrough and having first and secoind operatively interconnected opposed and generally parallel walls; and

at least one pair of wafer retention members located within said opening, one member releasably connected to said firs opposed wall and the other member releasably connected to said second wall, each member having a plurality of guidance portions and retention portions, said guidance portions capable of guiding conductor wafers that may be inserted in stacked relationship to each other into the housing and the retention portions capable of individually releasably securing conductor wafers within the housing; wherein each of the retention portions comprises an inwardly-projecting spring-like clip.

4,619,491

ELECTRIC CONNECTOR WITH PULL-OUT PLUG

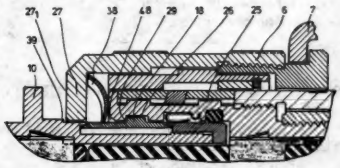
Pierre L. M. Drogo, Dampierre en Burly by Ouzouer sur Loire (Loiret), France

Filed Nov. 28, 1984, Ser. No. 675,764

Claims priority, application France, Nov. 29, 1983, 83 19049

Int. Cl.[4] H01R *13/62*

U.S. Cl. 339—45 M **8 Claims**



1. An electrical connector comprising:

a plug (1) having a generally cylindrical body open at one end and containing an insert of insulating material provided with pins for electrical connection;

a base (2) having a generally cylindrical body sized to fit coaxially in the open end of the plug and containing an insert of insulating material provided with pins to mate with those of the plug for electrical connection, the base having an exterior annular recess;

a coupling ring (6) mounted around the exterior of the plug body's open end, by means enabling the plug to undergo

controlled relative displacement in the axial direction and in rotation, the coupling rign having an edge (27) extending radially inwardly at one end; and

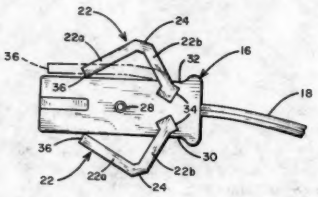
a locking device disposed in the recess of the base and having a plurality of control elements (17) normally projecting beyond the diameter of the base's body such that when the plug and base are joined together, at least one control element engages the coupling ring edge to retain the coupling ring on the body of the base, the locking device being capable of withdrawing into the recess of the base under the action of an axially opening force of the connector, which force is transmitted to the coupling ring and exceeds a predetermined threshold.

4,619,492

ELECTRICAL CONNECTOR WITH ONE-HAND DISCONNECT

Robert F. Corblick, 14830 - 58th St. N. - #515, Stillwater, Minn. 55082

Filed Feb. 4, 1985, Ser. No. 697,626
Int. Cl.[4] H01R *13/62*
U.S. Cl. 339—45 R **5 Claims**



1. An electrical connector for a detachable power cord comprising:

(a) an electrically insulated body member including at least one connector element coupled to an insulated electrical conductor, said connector element mounted in alignment with a contact surface of said body member at which an electrical connection is made; and

(b) first and second compressively resilient pusher members mounted exteriorly of the body member in longitudinally extensible relation thereto, each pusher member having a proximal end of a first arm portion coupled to the body member and a distal end thereof coupled to a second arm portion, whereby upon simultaneously squeezing the pusher members at the juncture of their first and second arm portions inwardly toward the body member, a distal end of each second arm portion expands in generally parallel relation to the external sides of the body member to exert a rearwardly directed extraction force remote from said contact surface.

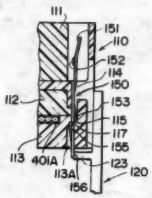
4,619,493

CONNECTING AND ENGAGING FIXTURE FOR ELECTRIC CONNECTOR

Sigeru Kikuta, Tokyo, Japan, assignor to Hirose Electric Co., Ltd., Tokyo, Japan

Filed Sep. 17, 1985, Ser. No. 776,865
Claims priority, application Japan, Oct. 16, 1984, 59-216849
Int. Cl.[4] H01R *13/631*
U.S. Cl. 339—91 R **6 Claims**

1. A connecting and engaging fixture for an electric connector, the electric connector having an insulating housing proper in which a contact is disposed and which is snugly fitted with an insulating housing proper of a mating electric connector, and a cable restraint plate which is assembled to the insulating housing proper and which serves to fix a cable end part to be spliced to the contact; said connecting and engaging fixture comprising a locking portion at its front end part, which serves to hold snug fitting between said electric connector and said mating electric connector in engagement; a rearward falling-off preventive engagement portion at its intermediate part, which serves to check said fixture from falling off rearwards in engagement with a rearward falling-off preventive engagement step provided in a fixture inserting hole formed at a side part of said insulating housing proper; and a forward falling-off



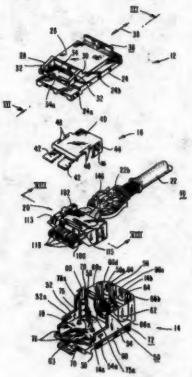
preventive shoulder and a cable restraint plate-engagement portion at its rear end part, the former of which serves to check said fixture from falling off frontwards in engagement with a forward falling-off preventive engagement step provided in said fixture inserting hole, and the latter of which engages said cable restraint plate in order to fasten said cable restraint plate assembled to said insulating housing proper in engagement.

4,619,494

SHIELDED ELECTRICAL CONNECTOR

Peter Noorily, Bridgewater, and Joseph P. Slachetka, Ringoes, both of N.J., assignors to Thomas & Betts Corporation, Raritan, N.J.

Filed Oct. 7, 1985, Ser. No. 785,313
Int. Cl.[4] H01R *13/20*
U.S. Cl. 339—103 M **15 Claims**



1. A shielded electrical connector comprising:

a housing defining a mating end for electrical connection to an electrical component and a cable receiving end for receipt of an electrical cable having a plurality of electrical conductors encased in an outer insulative jacket, said housing including first and second communicating compartments, said first compartment being adjacent said mating end of said housing and supporting a plurality of electrical contacts therein for electrical engagement with said conductors of said cable, said housing supporting an electrically conductive shield in said first compartment, strain relief means disposed between said first and second compartments for engaging a portion of said cable and retaining said cable thereat, said second compartment

having walls defining a plurality of accessible ports for receipt of said cable in selectively different directions, said second compartment being of sufficient size to accommodate bending of said cable therein from said strain relief means to any one of said ports.

4,619,495

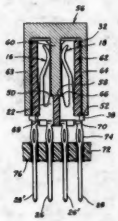
HIGH-DENSITY PRESS-FIT CARDEDGE CONNECTORS

Jerzy R. Sochor, 164 Rockview, Irvine, Calif. 92715

Continuation of Ser. No. 415,140, Sep. 7, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 641,940

Int. Cl.[4] H01R *9/09, 13/05*

U.S. Cl. 339—176 MP **8 Claims**



1. A cardedge connector having extremely-high-density contacts and capable of being reliably press-fit mounted in a wiring panel, comprising:

(a) an insulator housing having two rows of conductive contacts mounted within said housing,

(b) said housing comprising an insulating member having oppositely-facing upper and lower surfaces, oppositely-facing side surfaces, and oppositely-facing end surfaces, said upper surface having an elongated opening therein parallel to said side surfaces, said housing having two parallel side walls whose outer surfaces comprise said oppositely-facing side surfaces, each of said side walls having a downwardly-facing bottom surface,

(c) said elongated opening in said upper surface of said insulator housing extending into the body of said housing to form a slot separating said side walls, said slot having a predetermined length and width for receiving the edge of a circuit board of a predetermined width and thickness, said slot communicating with individual contact recesses extending from said slot toward and perpendicular to said side surfaces,

(d) said contacts each being elongated, vertically-oriented, and each mounted in a respective one of said recesses within said insulator housing by force fit,

(e) each contact having in the middle thereof a body portion containing means for retaining said body portion in a lower part of said insulator housing,

(f) each contact also having an upper portion comprising a cantilevered mating arm extending up from said body portion toward said upper surface,

(g) said mating arm having a convex mating surface adjacent the free end of said mating arm, said mating surface extending into said slot when said mating arm is in its free state so as to be positioned to mate with a printed circuit board when it is inserted into said slot,

(h) each contact also having a lower portion comprising a tail section extending down and out from the bottom surface of said housing, said tail section having means for interference retention in a hole of a predetermined size in a wiring panel when said tail section is pressed into said hole, thereby also to retain and electrically connect said connector to said wiring panel when its contact tails are pressed into respective holes in said wiring panel,

(i) the tail sections of the contacts in each row of contacts being arranged in two subrows, one subrow of tail sections being an outer subrow and one being an inner subrow, such that said connector has four subrows of tail sections extending downwardly therefrom, said four subrows of tail sections comprising two outer subrows and two inner subrows, alternating contacts in each row of contacts having tail sections in said outer and said inner subrows, respectively, such that every other contact in each row of contacts has a tail section in an outer subrow and the rest of the contacts in each row have contacts tail sections in an inner subrow, the tail sections in said outer subrow being at least partially aligned vertically with a respective sidewall of said insulator housing,

(j) each contact also having a cantilevered installation arm extending upward from its body portion, said arm having an upper end which forms an inner bearing surface extending into said slot, said inner bearing surface being straight and facing upwardly and parallel to said upper surface of said insulator housing,

(k) each contact also having a lateral portion extending laterally in an outward direction parallel to said upper surface of said insulator housing from said body portion of said contact, said lateral portion having a straight, upwardly-facing bearing surface which is parallel to said upper surface of said insulator housing, said upwardly-facing surface of said lateral portion contacting said downwardly-facing bottom surface of one of said side walls of said insulator housing, whereby when said insulator housing is pressed downwardly it will bear against said lateral portions of said contacts so as to apply balanced pressure to said contacts during insertion,

(l) each contact which has a tail section in said inner subrows having its tail section in vertical alignment with the cantilevered installation arm of such contact,

(m) the lateral sections of said contacts which have tail sections in said outer subrow extending under and out beyond their respective side wall of said insulator housing, said outer subrow tail sections being aligned under the outer bearing surfaces of said lateral portions,

(n) each contact shaped to be insertable into and withdrawable from said insulator housing from the bottom thereof only,

(o) whereby a seating tool having three parallel walls can be used to press said connector into said wiring panel by simultaneously (1) using the two outer walls thereof to straddle said connector and apply downward force directly to said lateral sections of said contacts which have tail sections in said outer subrow, such that said tail sections in said outer subrow can be forced directly into their respective holes in said wiring panel with reduced stress and more stability, and (2) inserting the center wall of said seating tool into said slot, such that said center wall will contact said inner bearing surfaces of said contacts and force said upwardly-facing bearing surfaces of said contacts, directly and via said housing, and hence said tail sections of said contacts which have their tail sections in said inner subrow, into their respective holes in said wiring panel with reduced stress and more stability.

4,619,496

COAXIAL PLUG AND JACK CONNECTORS

Edgar W. Forney, Jr., and George W. Michael, III, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation of Ser. No. 489,995, Apr. 29, 1983, abandoned. This application Sep. 14, 1984, Ser. No. 650,575

Int. Cl.[4] H01R *17/18*

U.S. Cl. 339—177 R **5 Claims**

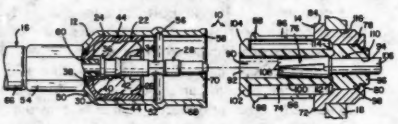
1. A coaxial connector, comprising:

matable plug and jack connector members;

said plug connector member including an inner shell member, an outer shell member and a dielectric member carrying a center contact member, said inner shell member having a large diameter section and a small diameter section, said dielectric member being secured within said

large diameter section, said center contact member having a bore to receive an exposed end of a center conductor of a coaxial cable therein while an exposed outer conductor of the coaxial cable is positioned onto said small diameter section, said center contact member being crimpable onto the center conductor end, said outer shell member having a larger diameter section and a smaller diameter section, said larger diameter section extending along said large diameter section and said smaller diameter section extending along said small diameter section and being crimpable onto said small diameter section connecting the outer conductor therebetween, said larger diameter section having a hood section including an internal latching groove, said hood section extending coaxially with respect to a pin contact section of said center contact member;

said jack connector member including a shell means and a dielectric means carrying a center contact means, said



shell means having bore means in which cylindrical section means of said dielectric means is disposed and secured therein, spring contact members extending outwardly from said shell means and being spaced from and coaxial with respect to said dielectric means as they extend therealong, free ends of said spring contact members having radiussed projections, said dielectric means having a passageway therethrough in which a receptacle section of said center contact means is secured;

said center contact member of the plug connector member extends along said passageway of said dielectric means so that said pin contact section electrically connects with said receptacle section and said radiussed projections of said spring contact members of the jack connector member are disposed in said internal latching groove forming an electrical connection therebetween and latching said plug and jack connector members when mated with each other.

4,619,497

DEVICE FOR ESTABLISHING CONNECTIONS BETWEEN ELECTRICAL CONDUCTORS

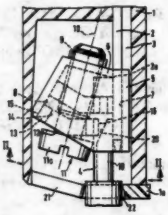
Ernst Vogel, Basel; Fritz Berger, Oberbuchsiten, and Armin Stampfli, Grenchen, all of Switzerland, assignors to Elektro-Apparatebau Olten AG., Olten, Switzerland

Filed Feb. 14, 1985, Ser. No. 701,578

Claims priority, application Switzerland, Feb. 28, 1984, 960/84

Int. Cl.⁴ H01R *13/207*

U.S. Cl. 339—244 R **14 Claims**



1. A device for electrically connecting a conductive member, particularly a flat conductive member, with at least one wire-like conductor, comprising a frame having opposing convergent first and second internal surfaces making an acute angle, said first surface being contacted by the conductive member and the wire-like conductor being located in the frame adjacent said conductive member; and means for releasably biasing the conductor against the conductive member in said frame, including a screw meshing with said frame so that the inclination of its axis with reference to said frame is fixed and such axis at least substantially halves said acute angle, and a clamping element having a slot-shaped opening for said screw and being arranged to move in the direction of said axis as well as transversely of said axis in response to rotation of said screw, said clamping member having a first marginal portion contacting the conductor in said frame and a second marginal portion slidable along said second internal surface to bias the conductor against the conductive member by way of said first marginal portion and to bias the conductive member against said first internal surface by way of the conductor in response to rotation of said screw to move said clamping member in its frame and in the direction of convergence of said internal surfaces.

4,619,498

SUSPENSION AND DRIVE METHOD AND CORRESPONDING DEVICE FOR OSCILLATING MIRROR IN SPACE TELESCOPE

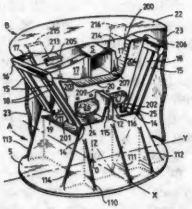
Pierre Croiset, Mandelieu, France, assignor to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Mar. 27, 1984, Ser. No. 593,889

Claims priority, application France, Mar. 30, 1983, 83 05235

Int. Cl.⁴ G02B *26/10*

U.S. Cl. 350—6.6 **26 Claims**



1. A method of suspending and bringing into oscillation a space telescope oscillating mirror, comprising the steps of:

mounting said oscillating mirror on connections attached to a support such that the mirror may oscillate about an oscillation axis between two first extreme angular positions;

further mounting on other connections to said support, independently from said oscillating mirror, an auxiliary mass such that it may also oscillate about said oscillation axis between two second extreme angular positions;

controlling said oscillating mirror with said auxiliary mass so as to cause periodical angular alternating motions at a given period of the oscillating mirror between the first extreme angular positions from said auxiliary mass which by reaction is submitted to angular motions in the opposite direction; and

momentaneously storing potential energy each time the mirror and the auxiliary mass come close to the respective extreme angular positions in the opposed phase.

4,619,499
SLEEVE FOR LARGE CAPACITY LIGHT WAVEGUIDE CABLES

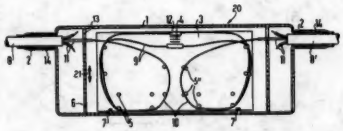
Klaus Gerber, Manching, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jun. 3, 1981, Ser. No. 269,871

Claims priority, application Fed. Rep. of Germany, Jul. 7, 1980, 30257002

Int. Cl.⁴ G02B *6/36, 7/26*

U.S. Cl. 350—96.20 **4 Claims**



1. A sleeve for light waveguide cables having a plurality of groups of individual light waveguide cores, said sleeve having a housing with a pair of cable entrances for receiving light waveguide cables whose cores are spliced together in said housing, each cable entrance having means for sealing the cable in the entrance, said housing containing a plurality of the removable plates with a single plate for each group of individual light waveguide cores of the light waveguide cable, means for arranging and releasably holding the plates in said housing in a spaced relationship, each of said plates containing means for holding the splices of the light waveguide cores and means for fixing and supporting the excess length of the light waveguide cores being spliced together, said means for fixing and supporting comprises a plurality of guide pins arranged on each of said removable plates for supporting the light waveguide cores in loose loops, and said housing having a comb with a plurality of spaced notches adjacent each cable entrance for receiving the light waveguide groups to space and distribute them to the respective removable plates so that each of the cables with a plurality of waveguide groups enters each entrance with the combs separating and distributing the groups to individual plates which separate and hold each of the spliced cores of the respective group.

4,619,500
METHOD FOR PRODUCING ORIENTATION LAYERS FOR LIQUID CRYSTAL DISPLAYS AND LIQUID CRYSTAL DISPLAYS HAVING ORIENTATION LAYERS

Hellmut Ahne, Röttenbach; Hans Krüger, Munich, and Roland Rubner, Röttenbach, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

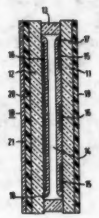
Continuation of Ser. No. 613,769, May 24, 1984, abandoned, which is a continuation of Ser. No. 350,609, Feb. 22, 1982, abandoned. This application Jan. 10, 1986, Ser. No. 818,051

Claims priority, application Fed. Rep. of Germany, Feb. 27, 1981, 3107519

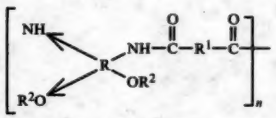
Int. Cl.⁴ G02F *1/133;* C08F *283/04*

U.S. Cl. 350—341 **10 Claims**

1. In a method for producing orientation layers for liquid crystal displays wherein a solution of an organic prepolymer is applied to a transparent substrate and subsequently annealed and subjected to an orientation treatment, the improvement comprising employing as said solution of an organic prepolymer, a solution of a prepolymer of a polyoxazole, a volatile compound and a solvent, and rubbing after annealing without photolyzing or irradiating before annealing as the orientation treatment, to produce a homogeneous orientation layer which will exhibit essentially no change in morphological structure up to a temperature of about 46° C., which shows essentially little intrinsic color when the layer thickness is at least about 0.1 μm, and which, after annealing, is reduced in thickness up to about forty percent compared with its thickness before annealing as a result of volatilization of the volatile compound during annealing,



wherein the polyoxazole prepolymer has the formula:



R being an at least partially aromatic or heterocyclic, halogenated or non-halogenated, tetravalent group; R^1 being a divalent, halogenated or non-halogenated aliphatic, cycloaliphatic, aromatic, or heterocyclic group; R^2 being an alkyl group which is free from an olefin substituent; and n being an integral number from 2 to about 100;

and wherein said volatile compound is a monomer, oligomer, polymer or mixture thereof which evaporates at least in part at a temperature above 250° C.

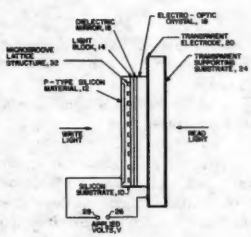
4,619,501
CHARGE ISOLATION IN A SPATIAL LIGHT MODULATOR

David Armitage, Los Altos, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 8, 1985, Ser. No. 689,699

Int. Cl.⁴ G02F *1/135, 1/015, 1/03*

U.S. Cl. 350—386 **4 Claims**



1. A spatial light modulator which comprises:

a silicon substrate having a first surface and an opposed second surface, and having p-type silicon material diffused in the first surface thereof to form a photodiode;

a dielectric mirror having a first surface and an opposed second surface, the first surface thereof being adjacent the second surface of said silicon substrate;

an electro-optic crystal having a first surface and an opposed second surface, the first surface thereof being adjacent the second surface of said dielectric mirror;

a transparent electrode having a first surface and an opposed

second surface, the first surface thereof being adjacent the second surface of said electro-optic crystal;

a transparent supporting substrate having a first surface and an opposed second surface, the first surface thereof being adjacent the second surface of said transparent electrode;

means for applying a voltage between said p-type material and said transparent electrode; and

a lattice configuration of microgrooves formed in the second surface of said silicon substrate to form a matrix of charge storage regions therein and prevent lateral charge transfer between said regions.

4,619,502

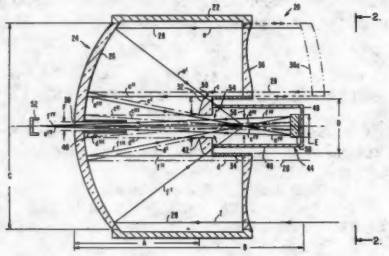
MIRROR FOCUSSING SYSTEM WITH NARROW VIEWING ANGLE

John P. Bagby, Anaheim Hills, Calif., assignor to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 2, 1984, Ser. No. 636,892

Int. Cl.[4] G02B *17/06*

U.S. Cl. 350—505 **6 Claims**



1. An optical system capable of guiding radiation from a distant source of the radiation to a sensor of the radiation, said system comprising:

a primary reflector having a concave surface facing the radiation from said source;

a secondary reflector having a convex surface facing the concave surface of said primary reflector;

said concave and said convex surfaces being matched to provide for multiple reflections therebetween of radiation incident on said primary reflector from a direction parallel to a central axis of said primary reflector;

apertures respectively in said reflectors;

tubular barriers communicating respectively with said apertures, a first of said barriers being oriented for enabling passage of multiply reflected rays of the radiation through said secondary reflector, and a second of said barriers being oriented for enabling passage of multiply reflected radiation to said sensor; and

an arrangement of means, including said first and second reflectors, for enabling the radiation to be directed from one of said barriers to a second of said barriers to impede the reception at said sensor of radiation emanating from sites away from the pack of radiation from said source.

4,619,503

TRANSMITTED LIGHT AND/OR INCIDENT LIGHT INVERSE MICROSCOPE

Guenter Reinheimer, Biebertal, and Norbert Gaul, Oberbiel, both of Fed. Rep. of Germany, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Fed. Rep. of Germany

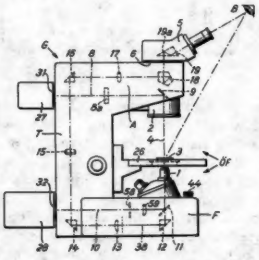
PCT No. PCT/DE82/00169, § 371 Date Apr. 26, 1983, § 102(e) Date Apr. 26, 1983, PCT Pub. No. WO83/00745, PCT Pub. Date Mar. 3, 1983

PCT Filed Aug. 25, 1982, Ser. No. 491,332

Claims priority, application Fed. Rep. of Germany, Aug. 26, 1981, 3133784; Aug. 17, 1982, 3230504

Int. Cl.[4] G02B *21/06, 21/18*

U.S. Cl. 350—511 **37 Claims**



1. A combination transmitted light and incident light inverted microscope, comprising:

(a) a substantially horizontal stand base;

(b) a substantially vertical stand support connected with the stand base;

(c) an objective disposed on the stand base;

(d) a substantialy horizontal stand arm connected with the stand support, wherein the stand base, the stand support and the stand arm define a "C"-shaped basic microscopic body, and wherein the basic microscope body defines a free opening directed toward a viewer;

(e) means for holding an object to be viewed, disposed in said free opening;

(f) a condenser for condensing illuminating light onto the object;

(g) an optical axis defined by the objective, the object and the condenser;

(h) an optical path disposed in the basic microscope body, and including an imaging partial beam originating at the object and extending within said stand base, said stand support and said stand arm;

(i) illuminating beam means for producing an illuminating beam, said illuminating beam means being selected from the group consisting of (1) a transmitted light illuminating beam which before striking said object runs in said stand arm essentially parallel to the imaging partial beam travelling along said optical path in the stand arm, (2) an incident light illuminating beam which before striking said object runs in said stand base essentially parallel to the imaging partial beam travelling along said optical path in the stand base, and (3) a combination of a transmitted light illuminating beam which before striking said object runs in said stand arm essentially parallel to the imaging partial beam travelling along said optical path in the stand arm, and an incident light illuminating beam which before striking said object runs in said stand base essentially parallel to the imaging partial beam travelling along said optical path in the stand base; and

(j) ocular means, attached to the stand arm, for converting the imaging partial beam into a viewable image.

4,619,504
OPHTHALMIC LENS WITH A MARKING AND METHOD OF PRODUCING THE MARKING

Erwin J. Daniels; Bernd Kratzer, and Hermann Schürle, all of Aalen, Fed. Rep. of Germany, assignors to Carl-Zeiss-Stiftung, Heidenheim, Fed. Rep. of Germany

Filed Sep. 2, 1983, Ser. No. 528,894

Claims priority, application Fed. Rep. of Germany, Sep. 10, 1982, 3233590

Int. Cl.⁴ G02C *7/10, 7/02;* B05D *1/32*

U.S. Cl. 351—163 **11 Claims**

1. An ophthalmic lens comprising: a lens body; a removable substance adhering to a region of the surface of said lens body and having a periphery defining an identification or control marking having a predetermined outline for conveying information to one viewing the same; and, an anti-reflection coating adhering directly to said surface outside of said region so as to completely surround said substance whereby the peripheral interface between said substance and said coating defines the outline of said marking.

4,619,505
REFRACTOMETRY PROCESS AND DEVICE FOR MEASURING THE DEGREE OF AMETROPIA, AND ESPECIALLY THE DEGREE OF ASTIGMATISM, OF THE EYE

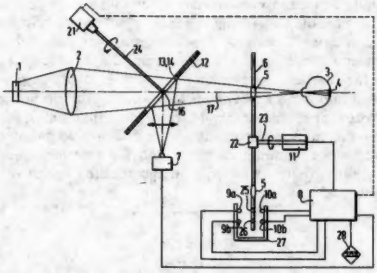
Jean C. Hache, Lille, and Mireille Servant, Villeneuve d'Ascq, both of France, assignors to Essilor International (Compagnie Generale d'Optique), Creteil, France

Continuation-in-part of Ser. No. 442,588, Nov. 8, 1982, abandoned. This application May 16, 1984, Ser. No. 610,632

Claims priority, application France, May 19, 1983, 83 08281

Int. Cl.⁴ A61B *3/10*

U.S. Cl. 351—211 **5 Claims**



1. An apparatus for refractometrically measuring the degree of ametropia and astigmastism of an eye, placed at a location predetermined with respect to said apparatus, comprising:

(a) a light source;

(b) optical means for shaping light emitted by said source into a focussed light beam propagated along a light path and directing said beam to said eye in a given direction defined by an optical test axis coinciding with the optical axis of said eye, so as to produce on the retina of said eye an image of said light source;

(c) corrective testing lens presenting means adapted to interpose adjacent said eye, successively any one of a plurality of corrective testing lenses of a lens set across said light beam, said testing lenses having different respective optical power values;

(d) circular screen means interposed in said light path between said light source and the eye for intercepting said light beam, said screen means being rotatably mounted on an axis thereof which passes through said optical test axis, said screen means and said axis thereof being inclined at an angle with respect to said optical test axis, said screen means including a black slit system with at least one opaque reflecting zone and at least one open zone, said zones being shaped in order to obtain an image of said source on said retina, the thus modified image of the source being reflected by said retina through said corrective test lens and said screen means to obtain a second image in a given plane;

(e) means for rotating said screen means about the axis thereof in successive angular pitches;

(f) light detector means disposed in said plane and centered on the axis of the beam reflected by the retina through said corrective test lens and said screen means, said detector means emitting a luminous intensity signal; and

(g) signal generating and processing means, associated with said lens presenting means, said means for causing said screen to turn, and said light detector means, for identifying that one of said corrective testing lenses which, when interposed across said test light beam by said lens presenting means, and depending upon the orientation of said black slit system, results in said light detector means producing a luminous intensity signal substantially equal to a desired value.

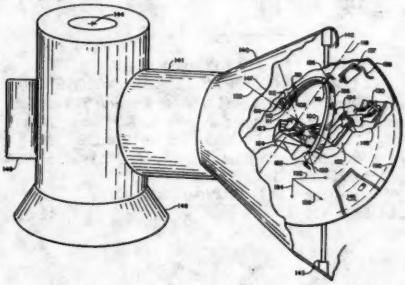
4,619,506
RANDOM PATTERN TRACKING ACCELERATION TOLERANCE TESTER

Daniel W. Repperger, Vandalia; Thomas J. Jennings, Dayton, and David A. Ratino, Centerville, all of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 29, 1984, Ser. No. 645,390

Int. Cl.⁴ A61B *3/02*

U.S. Cl. 351—243 **23 Claims**



1. G force response measuring apparatus comprising the combination of:

a first array of visual stimulus elements dispersed around the preripheral view area of a test subject;

means for energizing said first array elements to a visual stimulating state thereof according to a first random time pattern;

a second array of visual stimulus elements dispersed around

the peripheral view area of said test subject, each second array element being located adjacent a first array element;

means for energizing said second array elements to a visual stimulating state thereof in a second test subject controlled pattern tracking said first pattern to the best degree attainable by said test subject; and

means for determining the difference error between said first and second patterns.

4,619,507

METHODS AND APPARATI FOR GENERATING OPTICAL MATTES

Dennis R. Anthony, 3116 Kelton Ave., Los Angeles, Calif. 90034

Filed Aug. 22, 1983, Ser. No. 525,416

Int. Cl.[3] G03B *19/18*

U.S. Cl. 352—46 2 Claims

1. A method of making optical mattes, which method comprises photographing onto a suitable stock of film a luminous silhouette of an object on a dark background, the said luminous silhouette of the object on a dark background being created by optically uniting, as in a beam splitter, a positive image of the object and its nonblack background and a positive image of the background alone or a negative image of the object and its nonblack background and a negative image of the background alone and causing the light waves making up one of the images to interfere destructively with the light waves making up the other image.

4,619,508

ILLUMINATION OPTICAL ARRANGEMENT

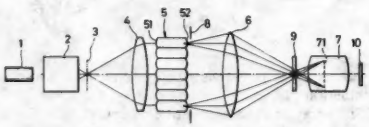
Masato Shibuya, Ohmiya, and Makoto Uehara, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Apr. 23, 1985, Ser. No. 726,232

Claims priority, application Japan, Apr. 28, 1984, 59-86669; Jan. 22, 1985, 60-9653

Int. Cl.[4] F21V *7/04*; G03B *27/54*

U.S. Cl. 353—122 12 Claims



1. An illumination optical arrangement comprising:

(a) light source means emitting a coherent light beam; and

(b) means for forming a substantially incoherent light source from said coherent light beam, said incoherent light source forming means including means for periodically deflecting said coherent light beam and scanning a predetermined scanning area by said coherent light beam, and optical means for forming a plurality of optical paths for directing the coherent light beam passed through said predetermined scanning area to a plurality of different secondary scanning areas, each of said plurality of secondary scanning areas being scanned by said periodically deflected coherent light beam.

4,619,509

FILM WINDING DEVICE FOR CAMERA

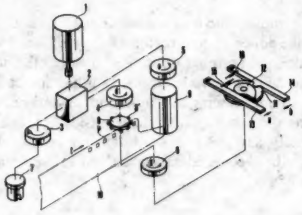
Chikara Aoshima, and Toru Nagata, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 495,430, May 17, 1983, abandoned. This application Jun. 19, 1985, Ser. No. 746,922

Claims priority, application Japan, May 24, 1982, 57-87521

Int. Cl.[4] G03B *1/00, 17/24*

U.S. Cl. 354—173.1 7 Claims



1. A film winding device for a camera, comprising:

a motor selectively rotatable in a film winding direction and a film rewinding direction;

a film takeup spool;

a sprocket selectively rotatable in the film winding direction and in the film rewinding direction, said sprocket being provided with teeth engageable with perforations provided in the film;

shutter charging means charged through said sprocket;

film rewinding means; and

first clutch means which transmits the rotation of said motor to said sprocket, said first clutch means having an input side connected to said motor and an output side connected to said sprocket, wherein said first clutch means invariably retains a nontransmissive state when said input side rotates in a rewinding direction regardless of the rotating speed and rotating direction of said output side and retains a transmissive state for transmitting the rotation of the motor to the sprocket, and the shutter charging means when said input side rotates in a winding direction and at a faster speed than said output side, said first clutch means retaining a nontransmissive state when said input side rotates in a winding direction and the rotating speed of said output side is faster than the rotating speed of the input shaft.

4,619,510

CAMERA

Kazuhiro Nakanishi, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,641

Claims priority, application Japan, Jul. 27, 1984, 59-158457; Jul. 27, 1984, 59-158458; Jul. 27, 1984, 59-158459; Aug. 7, 1984, 59-166281

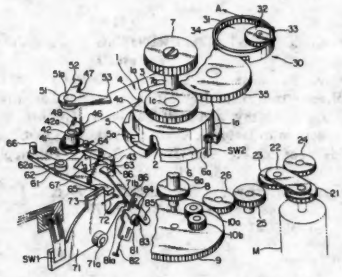
Int. Cl.[4] G03B *1/18*

U.S. Cl. 354—173.1 18 Claims

15. A camera comprising a motor, a changeover mechanism and switch means,

said changeover means transmitting selectively the driving force of said motor to a film-wind mechanism and a film-rewind mechanism or to a lens-moving mechanism,

said switch means letting said motor drive said film-rewind



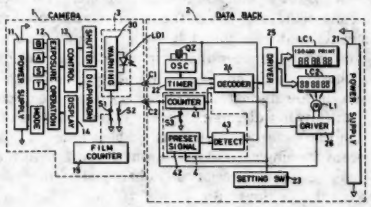
mechanism to perform the rewind of film or drive said lens-moving mechanism to perform the movement of the lens, said switch means being turned ON either by a film-rewind operation member or by a lens-moving operation member.

4,619,511

WARNING SYSTEM FOR REMAINING AMOUNT OF FILM IN A CAMERA

Tetsuro Goto, Funabashi, and Yoshiyuki Nakano, Tokyo, both of Japan, assignors to Nippon Kogaku K. K., Tokyo, Japan

Filed Nov. 13, 1985, Ser. No. 797,666
Claims priority, application Japan, Nov. 19, 1984, 59-244267
Int. Cl.[4] G03B *17/36*
U.S. Cl. 354—217 **10 Claims**



1. A photographing system comprising:

a camera comprising:

means for generating an output signal at each exposure of the film;

counter means subjected to stepwise increment at each of said exposures and adapted to generate an output after counting a determined number; and

warning means to be activated in response to the output of said counter means; and

an accessory unit to be connected to said camera and comprising:

means for retaining a number of exposures to be preset by the operator;

means for accumulating the number of said output signals generated by said camera; and

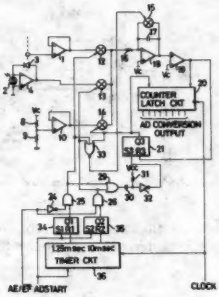
means for supplying a warning signal to said camera for activating said warning means when the accumulated number of said output signals reaches said preset number of exposures.

4,619,512

AD CONVERSION DEVICE FOR CAMERA

Shuichi Kiyohara, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 14, 1985, Ser. No. 701,419
Claims priority, application Japan, Feb. 15, 1984, 59-27857
Int. Cl.[4] G03B *7/091*
U.S. Cl. 354—458 **10 Claims**



1. An AD conversion device for a camera comprising:

(A) a double integrating type AD conversion circuit for integrating information corresponding to object brightness for a prescribed length of time and thereafter inversely integrating the thus integrated value at a constant speed; and

(B) a control circuit for controlling an integrating time of the AD conversion circuit to carry out the AD conversion, said control circuit including:

(a) a first mode for AD converting information corresponding to an object brightness; and

(b) a second mode for AD converting information other than the information corresponding to the object brightness, the integrating time for the information other than the information corresponding to the object brightness in said second mode being different from the prescribed length of the integrating time for the information corresponding to the object brightness in the first mode.

4,619,513

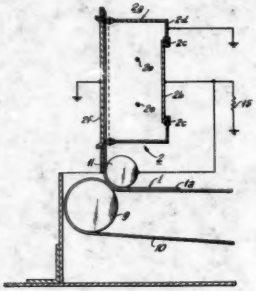
ELECTROPHOTOGRAPHIC SYSTEM

Keiichi Yamana; Hajime Tachibana, and Shuichi Ohtsuka, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 14, 1984, Ser. No. 589,355
Claims priority, application Japan, Mar. 18, 1983, 58-44324
Int. Cl.[4] G03G *15/02*; H01T *19/04*
U.S. Cl. 355—3 CH **8 Claims**

1. An electrophotographic system comprising: corona wires covered by a shield case, charging means for charging an electrophotosensitive surface of an electrophotographic member by applying high voltage on said corona wires, exposure means for projecting picture image information on the electrophotosensitive surface of the electrophotographic member after having been charged by said charging means to form electrostatic latent images thereon, development means for developing the electrostatic latent images formed by said exposure means on the electrophotosensitive surface by a magnetic brush process, a conveying mechanism for carrying the electrophotographic member through the charging means, the exposure means and the development means consecutively, a conveyor roller made of conductive material which abuts on said electrophotosensitive surface of the electrophotographic member after the charging means but before the development

means and which is electrically insulated from other components, said shield case having at least one portion which is



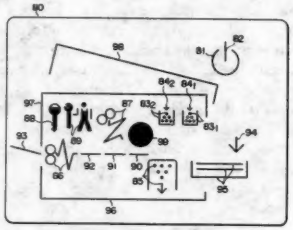
insulated from another portion thereof and is electrically connected with said roller so as to apply a bias voltage thereon.

4,619,514

MONOCHROMATIC PHOTOCOPYING APPARATUS AND METHOD INCLUDING COLOR SELECTION

Fumito Ide, Zama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 15, 1984, Ser. No. 661,191
Claims priority, application Japan, Oct. 18, 1983, 58-195030
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 R **10 Claims**



1. An apparatus for producing a monochromatic reproduction comprising:

a photosensitive drum;

means for forming latent image on said photosensitive drum;

means for alternately selecting a first and a second color;

developing means, including means for storing a supply of said toner of said first color and means for storing a supply of toner of said second color, said developing means operatively coupled to said selecting means, said developing means for supplying first color toner to said photosensitive drum if said selecting means selects said first color and for supplying second color toner to said photosensitive drum if said selecting means selected said second color toner, said supply of first or second color toner devloping said latent image;

means, operatively connected to said selecting means, for visually indicating which of said first and second colors is selected by said selecting means;

first depletion sensing means for producing a first signal if said supply of first color toner stored by said first color toner storing means is depleted;

second depletion sensing means for producing a second signal if said supply of second color toner stored by said second color toner storing means is depleted;

means for visually indicating said supply of first color toner is depleted in response to said first signal and for visually indicating said supply of second color toner is depleted in response to said second signal; and

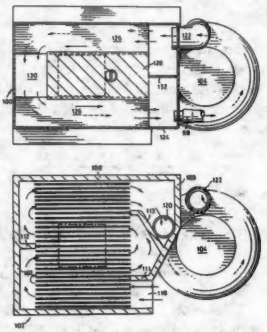
means for transferring an image developed by said developing means from said drum to a medium.

4,619,515

ELECTROSTATIC PRINTING APPARATUS AND METHOD

Andrzej Maczuszenko, Etobicoke; Ernest Davison, Brockville; Brian Otter; Brian F. Whittaker, both of Toronto; Christopher Novak, Whitby, and Dolf Landheer, Toronto, all of Canada, assignors to Delphax Systems, Mississauga, Canada

Division of Ser. No. 446,759, Dec. 3, 1982. This application Mar. 25, 1985, Ser. No. 698,665
Claims priority, application Canada, Dec. 4, 1981, 391561
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 R **10 Claims**



1. In an electrostatic printing apparatus comprising a rotatable electrostatically chargeable printing drum and ion deposition means for forming an electrostatic image on said electrostatically chargeable drum, the improvement comprising:

means for discharging a flow of air along a path of flow extending between the periphery of said electrostatically chargeable drum and said ion deposition means,

said air flow discharge means being oriented to discharge the air flow in a direction opposite to the direction of rotation of said electrostatically chargeable drum;

means forming an enclosure around a portion of the periphery of said electrostatically chargeable drum, and including the air flow path;

said air flow discharge means including means defining outlets for discharging said air into the flow path and means conforming to the periphery of said electrostatically chargeable drum and forming with said drum periphery a constriction through which air passes in leaving the flow path.

4,619,516

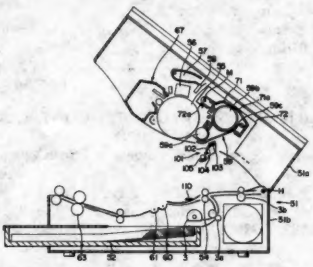
REPRODUCING APPARATUS

Yasuyuki Iwai, Hachioji, Japan, assignor to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Filed Nov. 27, 1984, Ser. No. 675,136
Claims priority, application Japan, Dec. 2, 1983, 58-228767; Dec. 2, 1983, 58-228768
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—3 DD **30 Claims**

1. In a reproducing apparatus comprising an upper frame having at least an image retainer and a developing device arranged near said image retainer for developing with toner a latent image on said image retainer, and a lower frame engaging at one portion thereof with said upper frame, said upper

frame being can be displaced relative to said lower frame, the improvement characterized in that said developing member



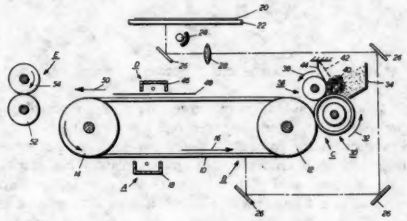
being separated from the surface of said image retainer by the displacement of said upper frame.

4,619,517

DEVELOPMENT APPARATUS

John G. Ruhland, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 20, 1985, Ser. No. 713,976
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—3 DD **16 Claims**



1. An apparatus for developing a latent image with marking particles, including:

means for transporting the marking particles to the latent image;

means for electrically charging the marking particles being moved to the latent image by said transporting means;

means for storing a supply of marking particles and dispensing marking particles to said transporting means; and

means, spaced from said charging means, for electrically discharging the wrongly charged marking particles returned to said storing means.

4,619,518

TWO-COLOR IMAGE FORMING APPARATUS

Kazuhiro Kameyama, and Nobuo Akiba, both of Higashiyamatoshi, Japan, assignors to Casio Electronics Mfg. Co., Ltd. and Casio Computer Co., Ltd., both of Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,326
Claims priority, application Japan, Jul. 31, 1984, 59-159285
Int. Cl.[4] G03G *15/00, 15/01*
U.S. Cl. 355—4 **8 Claims**

1. A two-color image forming apparatus comprising means for forming a first visible image on an image bearing member, means for forming a second visible image on said image bearing member still carrying the first visible image, with said second visible image being different in color from said first visible image, and means for rotating a cylindrical non-magnetic sleeve and a permanent magnetic roll equipped within said non-magnetic sleeve in opposite directions with regard to each other, thereby allowing a developer for the second visible

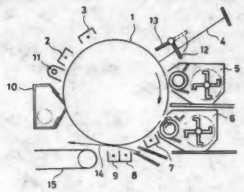


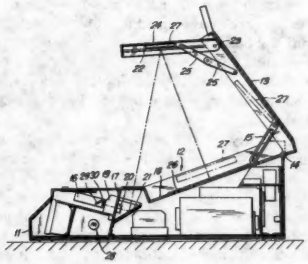
image to be conveyed onto said non-magnetic sleeve in a direction opposite to the rotation of said permanent magnetic roll.

4,619,519

ELECTROPHOTOGRAPHIC CAMERA PROCESSOR-READER

Michihiko Takahashi; Eiichi Saito, both of Tokyo; Takeshi Okano, and Sadaaki Nakaoka, both of Nishinomiya, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jul. 19, 1984, Ser. No. 632,222
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—11 **5 Claims**

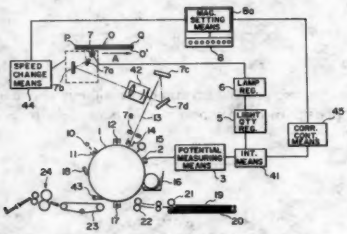


1. An electrophotographic camera processor-reader comprising: a housing for removably receiving an electrophotographic film, an electrophotographic process head fixedly disposed in said housing and including a charging section, an exposure section, a developing section and a fixing section for sequentially performing a series of processing steps on the electrophotographic film, a combined screen and original-supporting plate fixedly disposed in said housing for functioning as an opaque screen onto which enlarged picture image data recorded on the electrophotographic film are projected and functioning also as an original-supporting plate, a recording-projecting lens positioned in said housing at a position opposite the exposure section of said electrophotographic process head, said process head being interposed between the recording-projecting lens and the electrophotographic film, said recording-projecting lens functioning to focus picture image data carried by an original placed on said combined screen and original-supporting plate onto the electrophotographic film and functioning also to project picture image data recorded on the electrographic film onto said combined screen and original-supporting plate, and a light source arranged for projecting the picture image data recorded on said electrophotographic film onto said combined screen and original-supporting plate with light transmitted through said film.

4,619,520
VARIABLE MAGNIFICATION ELECTROPHOTOGRAPHIC COPYING APPARATUS

Junji Araya, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1984, Ser. No. 572,847
Claims priority, application Japan, Jan. 26, 1983, 58-9970
Int. Cl.[4] G03G *15/00*
U.S. Cl. 355—14 R **13 Claims**



1. A variable magnification electrophotographic copying apparatus, comprising:

image forming means for applying light reflected by an original to be copied to form an image of the original, said image forming means including speed changing means for changing the speed of a movable member for image formation in accordance with a desired magnification of copy;

magnification setting means for setting a one-to-one mode wherein the image is formed in a unit magnification and a magnified mode wherein the image is formed in a non-unit magnification;

detecting means for detecting information corresponding to a density of the original using the light reflected by the original;

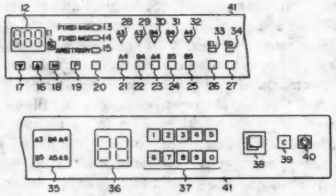
automatic density control means, responsive to said detecting means, for automatically controlling a density of the image formed; and

automatic correcting means for correcting, in the magnified mode, said automatic density control means in accordance with the speed at which the movable member is moved based upon the magnification set by said setting means.

4,619,521
IMAGE PROCESSING APPARATUS

Kazuki Miyamoto, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,416
Claims priority, application Japan, Mar. 31, 1984, 59-62231; Mar. 31, 1984, 59-62232
Int. Cl.[4] G03G *15/00*; G03B *27/52*
U.S. Cl. 355—14 R **19 Claims**



1. An image processing apparatus conprising:

output means for outputting data corresponding to an original image length;

key input means for manually setting data corresponding to a desired reproducing image length;

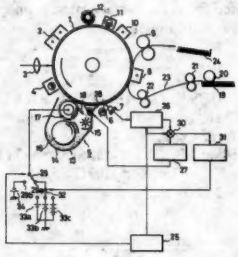
arithmetic means for calculating a magnification based on the data output by said output means and the data set by said key input means; and

display means for displaying the magnification calculated by said arithmetic means.

4,619,522
DUAL MODE IMAGE DENSITY CONTROLLING METHOD

Chikara Imai, Tokyo, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Feb. 22, 1985, Ser. No. 704,826
Claims priority, application Japan, Feb. 9, 1982, 57-19220; Jun. 18, 1982, 57-104873; Jun. 18, 1982, 57-104874
Int. Cl.[4] G03G *15/08*
U.S. Cl. 355—14 D **9 Claims**



1. A method for controlling the image density of a copy image, comprising:

a first mode of operation including the steps of charging a photosensitive member uniformly, projecting a light image reflecting from a reference pattern having a predetermined reflectance to said photosensitive member to form an electrostatic latent image of said pattern, developing said latent image with a developer, detecting the density of said developed image, comparing said detected density with a first reference value, and replenishing toner to said developer in accordance with a result of said comparison; and

a second mode of operation including the steps of providing a region of approximately saturating residual potential on said photosensitive member, developing said region under a predetermined bias potential, detecting the density of said developed region, and comparing said detected density with a second reference value, whereby said first and second modes of operation are carried out selectively.

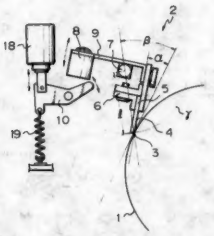
4,619,523
TONER CLEANING APPARATUS IN ELECTROPHOTOGRAPHY

Masahiko Maeda, Izumiotsu; Toru Nakazawa, Kumatori; Yasuharu Utsunomiya, Nara, and Ryuji Wataki, Sakai, all of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Jul. 25, 1984, Ser. No. 634,466
Claims priority, application Japan, Jul. 27, 1983, 58-135898
Int. Cl.[4] G03G *21/00*
U.S. Cl. 355—15 **5 Claims**

1. A toner cleaning apparatus for removing a toner left on the surface of an electrophotographic photosensitive material by a doctor blade in the electro-photographic process, which comprises an elastic doctor blade having a toner-scraping top end, a holder for supporting the base of the doctor blade, a fulcrum for pivotably supporting said holder and a pressing mechanism for pressing the top end of the doctor blade to the surface of the photosensitive material, wherein the pressing

mechanism comprises a weight and wherein the doctor blade is located on the same side as the photosensitive material with respect to the fulcrum, and the weight, is located on the side opposite to the photosensitive material with respect to the fulcrum, the fulcrum and doctor blade are arranged so that on the feed-out side of the photosensitive material, the contact angle α between the top end of the doctor blade and the photo-



sensitive material is smaller than the angle β between the photosensitive material and the line connecting the top end of the doctor blade to the fulcrum, the pressing mechanism and doctor blade are arranged in such an elastic engagement relation that as the applied stress is increased, the top end of the doctor blade is retreated to the feed-out side and the degree of flexion of the doctor blade is increased, said angle α is from 10° to 35° and said angle β is from 25° to 45°.

4,619,524

DEVICE FOR THE PROJECTION COPYING OF MASKS

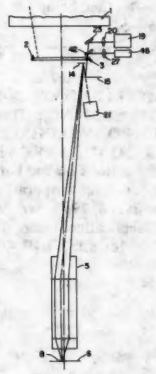
Werner Tabarelli, Vaduz, and Ernst Löbach, Eschen, both of Liechtenstein, assignors to Perkin-Elmer Censor Anstalt, Vaduz, Liechtenstein

Filed Oct. 2, 1984, Ser. No. 656,876

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1984, 3402178

Int. Cl.⁴ G03B *27/42*

U.S. Cl. 355—53 **9 Claims**



1. A projection mask aligner for aligning a mask and a workpiece relative to one another, said aligner comprising:

a radiation source for projecting patterns formed on a mask onto a radiation sensitive surface of a substrate via a projection lens means;

at least one window formed in the mask;

at least one mark formed on the substrate;

adjustment light means for projecting adjustment light through said window and said projection lens means onto the substrate;

detector means disposed to receive adjustment light reflected from said substrate via said projection lens means for determining the position of said at least one window relative to a corresponding said at least one mark;

spectrometric means also disposed in the path of the reflected adjustment light to receive said reflected adjustment light and determine changes in a mean wavelength of the reflected adjustment light;

whereby color errors introduced by the finite bandwidth of the adjustment light may be determined.

4,619,525

CAMERA CASING FOR MICROFILM CAMERAS

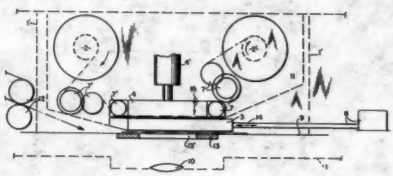
Josef Schaut, Freiher von Stein Strasse 8, 6367 Karben 1, and Peter Rüppel, Söderweg 39, Bad Nauheim, both of Fed. Rep. of Germany

Filed Aug. 13, 1984, Ser. No. 640,330

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1983, 3329395

Int. Cl.⁴ G03B *27/32, 27/52*

U.S. Cl. 355—64 **10 Claims**



1. A camera case for a microfilm camera, which comprises

(a) an exposure station,

(b) a support plate at the exposure station for supporting a segment of a film for exposure in a filming plane,

(c) a conveyor for selectively delivering a succession of punch cards to the support plate, each punch card carrying a respective one of the film segments for exposure in the filming plane,

(d) a punch card holder arranged for reciprocation between an operative position above the support plate for holding a respective one of the punch cards on the support plate and an inoperative position laterally adjacent the support plate,

(e) two spools mounted above the punch card holder at respective sides thereof and arranged to hold a continuous film strip unreeled from one of the spools and reeled onto the other spool, and

(f) a film strip holder arranged above the support plate for reciprocation in a direction extending perpendicularly to the filming plane between an operative position for holding a respective film segment of the film strip on the support plate when the punch card holder is in the inoperative position and an inoperative position above the punch card holder when the punch card holder is in the operative position.

4,619,526

SUCTION FILM HOLDER

Finn Hougaard, Copenhagen, Denmark, assignor to Eskofot A/S, Ballerup, Denmark

Filed May 9, 1985, Ser. No. 732,411

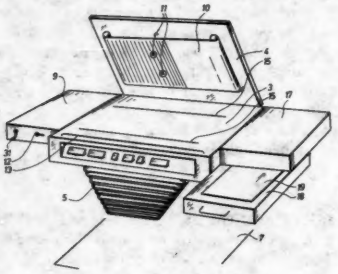
Claims priority, application Denmark, Sep. 3, 1984, 4213/84

Int. Cl.⁴ G03B *27/60*

U.S. Cl. 355—73 **14 Claims**

1. A movable suction film holder preferably for a reproduction camera comprising a flexible cover with one or more

suction cups for advancing the film and a number of substantially transverse grooves to be evacuated separately wherein



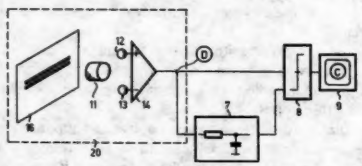
air is blown under the flexible cover after the exposure, but before the advancing of the film by means of the suction cups.

4,619,527

PROCESS AND DEVICE FOR AUTOMATICALLY DETECTING FAULTS IN FABRICS AND SIMILAR TEXTILE SHEET-LIKE STRUCTURES

Rolf Leuenberger, Pfäffikon, and Christian Hunziker, Mönchaltorf, both of Switzerland, assignors to Zellweger Uster, Ltd., Uster, Switzerland

Filed Dec. 9, 1983, Ser. No. 559,802
Claims priority, application Switzerland, Feb. 3, 1983, 624/83
Int. Cl.[4] G06K *9/08*; G01N *21/16, 21/32*
U.S. Cl. 356—238 **20 Claims**



1. A process for automatically detecting faults in articles, such as fabrics and similar textile sheet-like structures, by filtering an image of the article to increase the contrast between the overall texture of the article perceived as normal and the local deviations therefrom which are perceived as faults, comprising the steps of:

scanning the surface of the article to form an image of the surface thereof;

transforming said image using at least two spatial filters which are adapted to detect straight-line contour elements in the weft and warp directions thereof to produce respective transformed images; and

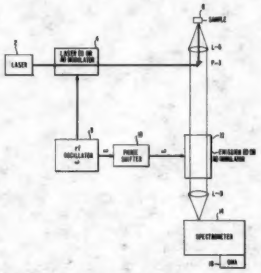
reducing said transformed images to binary black-white images by comparing them to a characteristic grey value threshold for each direction.

4,619,528

PHASE RESOLVED MODULATION RAMAN SPECTROMETER

Azriel Z. Genack, New York, N.Y., and Bruce N. Perry, Flemington, N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Filed Jan. 26, 1984, Ser. No. 574,130
Int. Cl.[4] G01J *3/44*
U.S. Cl. 356—301 **7 Claims**



1. A system for measuring fluorescencesuppressed Raman scattering from a sample comprising:

(a) a continuous wave laser beam means, whose intensity is modulated by a first modulator said modulated beam striking said sample so as to produce fluorescent and Raman radiation, wherein said fluorescent radiation is out of phase with Raman radiation by the angle ϕ;

(b) an optical modulator means positioned so that said fluorescent and Raman radiation passes through a second modulator;

(c) a phase shifter means for adjusting the phase of said second modulator by $\phi \pm \phi_o$ relative to said modulated laser beam where ϕ_o is an arbitrary phase;

(d) spectrometer means for dispersing said radiation passing through said second modulator into spectra as a function of wavelength;

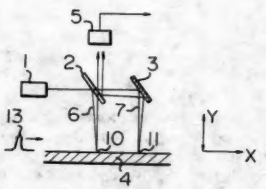
(e) means for detecting said dispersed radiation, said spectra obtained at $\phi - \phi_o$ then being subtracted from said spectra obtained at $\phi + \phi_o$.

4,619,529

INTERFEROMETRIC CONTACT-FREE MEASURING METHOD FOR SENSING MOTIONAL SURFACE DEFORMATION OF WORKPIECE SUBJECTED TO ULTRASONIC WAVE VIBRATION

Tohru Iuchi, and Fumio Tanaka, both of Kawasaki, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jan. 4, 1983, Ser. No. 455,551
Claims priority, application Japan, Jan. 12, 1982, 57-2995
Int. Cl.[4] G01B *9/02*
U.S. Cl. 356—358 **10 Claims**



7. An interferometric contact-free measuring method for sensing motional surface deformation of a workpiece caused

by a laser beam applied to a measuring point on the workpiece surface and inducing an ultrasonic wave therein comprising the steps of:

impinging a first pulse laser beam on a surface of the workpiece to induce an ultrasonic wave in the workpiece,

generating a second laser beam,

splitting the second laser beam into a measuring beam and a reference beam,

causing the measuring beam to impinge upon the measuring point on the workpiece surface,

causing the reference beam to impinge upon a reference beam point on the workpiece surface separate and distinct from the measuring point, and

causing measuring and reference beams reflected from the workpiece surface at the measuring point and the reference point, respectively, to impinge upon the same optical detector.

4,619,530

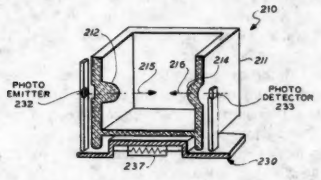
COMBINED CUVETTE WITH INTEGRAL OPTICAL ELEMENTS AND ELECTRICAL CIRCUIT WITH PHOTOEMISSIVE AND PHOTOSENSITIVE ELEMENTS IN INTIMATE OPTICAL CONTACT WITH SAID OPTICAL ELEMENTS

Peter M. Meserol, Montville, and Jesse L. Acker, Rockaway, both of N.J., assignors to Personal Diagnostics, Inc., Whippany, N.J.

Continuation-in-part of Ser. No. 512,121, Jul. 8, 1983, abandoned. This application Dec. 24, 1985, Ser. No. 815,294

Int. Cl.[4] G01N *21/00*

U.S. Cl. 356—440 **6 Claims**



1. In combination for use in photometric measurements, a cuvette with integrally molded optical means and an electrical circuit including photoemissive and photosensitive elements in intimate optical contact with said optical means, comprising:

molded cuvette means for receiving a medium undergoing change in optical characteristics which change modifies the energy level of a ray of energy passing through said medium;

said cuvette means provided with integrally molded first and second ray modifying optical means, said first ray modifying optical means for receiving and modifying said ray in a first predetermined manner and for transmitting said ray into said medium and said second ray modifying optical means for receiving and modifying said ray in a second predetermined manner upon passing through said medium and for transmitting said ray from said cuvette means; and

electrical circuit means including photoemissive means and photosensitive means, said photoemissive means in intimate optical contact with said first ray modifying optical element means and for producing said ray of energy and said photosensitive means in intimate optical contact with said second ray modifying optical means and for receiving said ray of energy.

4,619,531

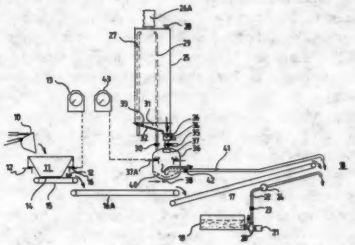
BATCHING PLANT

Trevor G. Dunstan, Brisbane, Australia, assignor to Dunstan & Partners Pty. Ltd., Australia

Filed Nov. 14, 1984, Ser. No. 671,332

Int. Cl.[4] B28C *5/06*

U.S. Cl. 366—3 **16 Claims**



16. A process for batching particulate materials including batching of finely divided material and batching of denser materials including the steps of:

(i) loading said denser material into batching means and conveying via a dense material conveyor the batched denser material therefrom to a discharge location;

(ii) storing finely divided material in a storage bin and fluidizing said finely divided material and discharging same through a discharge outlet of the storage bin to a pressurized batching vessel;

(iii) closing valve means associated with the discharge outlet after finely divided material has been discharged therefrom;

(iv) closing valve inlet means associated with the discharge outlet so as to seal the pressurized batching vessel from the storage bin;

(v) fluidizing finely divided material in the pressurized batching vessel and determining the amount of the batch;

(vi) separately delivering the finely divided material to the discharge location by passing the batched amount of finely divided material into a transfer conduit which extends to said discharge location indpendently of said dense material conveyor by opening valve means associated with the transfer conduit to allow said batched amount to pass to said discharge location; and

(vii) closing said valve means.

4,619,532

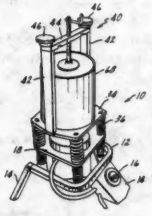
SHAKER FOR PAINT CONTAINERS

John W. Schmidt, III, Safety Harbor, Fla., assignor to Everett Douglas Hougen, Flint, Mich.

Filed Nov. 29, 1984, Ser. No. 676,429

Int. Cl.[4] B01F *11/00*

U.S. Cl. 366—110 **23 Claims**



1. A shaker for a paint container comprising a base adapted

to be positioned on a support surface, a motor support member spaced vertically from said base, resiliently flexible means extending vertically between said motor support member and said base and resiliently supporting the support member on said base, a motor mounted on said support member and having a vertically extending output shaft, a flyweight mounted eccentrically on said shaft for rotation in a generally horizontal plane, a container support member spaced vertically above said motor support member, means for fixedly securing one or more containers to be shaken on said container support member and resiliently flexible means extending vertically between said two support members and supporting the container support member on the motor support member, said resiliently flexible means being resiliently flexible both vertically and laterally, said rotating flyweight laterally tilting said motor support member in the direction of rotation and simultaneously imparting a violent orbital and lateral motion to the container and the container support member whereby, when a liquid filled container is secured on said container support member, the motor and rotating eccentric flyweight, acting through said motor support plate and the second-mentioned resilient means, generate forces which impart a violet orbital and lateral motion to the container and the first-mentioned resilient means substantially absorb the resultant forces on the motor support plate and prevent them from being transmitted to said base.

4,619,533

TUYERE PYROMETER

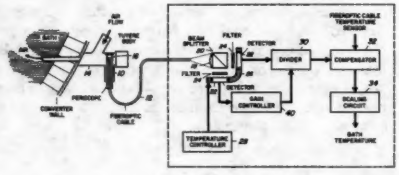
John M. Lucas, Outremont; Frank Kitzinger, Montreal; Vladimir M. Labuc, Hudson; John G. Peacey, Lancaster; Albert Pelletier, Noranda, and Gregory A. Wint, Pierrefonds, all of Canada, assignors to Noranda Inc., Toronto, Canada

Filed Feb. 22, 1985, Ser. No. 704,513

Claims priority, application Canada, Apr. 24, 1984, 452678

Int. Cl.[4] G01K *1/14*

U.S. Cl. 374—141 **9 Claims**



1. An apparatus for measuring bath temperature of a metallurgical furnace through a tuyere which is used to blow air into the metallurgical furnace and needs to be regularly cleaned by a tuyere puncher, said apparatus comprising:

(a) a movable periscope adapted to be inserted into said tuyere at an angle to the longitudinal axis of the tuyere, and fully retracted therefrom;

(b) a fiber optic cable having one end mounted in said periscope for receiving radiation entering the tuyere from the bath of the furnace;

(c) an actuator for moving said periscope to an operating position within said tuyere to detect radiation being emitted from the bath and for moving said periscope to a fully retracted position from the tuyere to allow entry of the puncher into the tuyere to clean the tuyere; and

(d) a two wavelength pyrometer connected to the other end of said fiber optic cable for analysing the radiation transmitted through the fiber optic cable to provide an indication of the temperature of the bath.

4,619,534

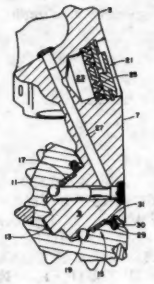
ROLLER CUTTER DRILL BIT HAVING A TEXTURIZED SEAL MEMBER

Jeffery E. Daly, Cypress, and Robert J. Kotch, Humble, both of Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Sep. 12, 1984, Ser. No. 649,646

Int. Cl.[4] F16C *33/74;* E21B *10/22;* F16J *9/00*

U.S. Cl. 384—94 **12 Claims**



1. A rotary drill bit for use in drilling a well bore comprising:

a bit body having a threaded pin at its upper end adapted to be detachably secured to a drill string for rotating the drill bit, and at least one depending leg at its lower end having a generally cylindrical bearing journal, constituting a first bearing member of the bit;

a roller cutter of generally conical shape constituting a second bearing member of the bit, the roller cutter having a recess therein of generally circular section for receiving the bearing journal;

bearing menas for rotatably mounting the roller cutter on the bearing journal; and

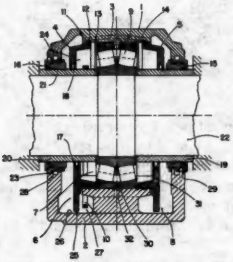
a lubrication system for providing lubricant to the bearing means comprising a reservoir holding a supply of lubricant, passaging in the bit body providing fluid communication between the reservoir and the bearing means, and seal means in an annular seal cavity between the roller cutter and the bearing journal for blocking flow of lubricant past the bearing means and out of the bit body, and for blocking flow of drilling fluid past the seal means and into the bit body;

said seal means comprising an annular seal member of elastomeric material compressed radially between said bearing members and having a circumferentially continuous annular engagement face in sealing, sliding frictional engagement with one of the bearing members, said annular engagement face having a surface texture defining a pattern of alternating depressions and projections to form a plurality of radially compressed pockets to hold lubricant therein against said one bearing member, said pattern of alternating depressions and projections on said surface texture being arranged and constructed to substantially block the flow of lubricant past said seal member and out of the bit body, and to substantially block the flow of drilling fluid past said seal member inwardly to said bearing means and inside the bit body.

4,619,535
BEARING HOUSING

Werner Haugwitz, Schweinfurt, Fed. Rep. of Germany, assignor to SKF Gmbh, Schweinfurt, Schweinfurt, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,389
Claims priority, application Fed. Rep. of Germany, Feb. 25, 1984, 3406963
Int. Cl.[4] F16C *33/66, 35/00*
U.S. Cl. 384—472 **11 Claims**

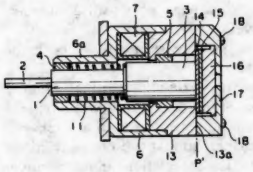


1. A bearing housing for the horizontal support of a shaft with oil ring lubrication divided in the axial direction, means defining an outer chamber in the bearing housing containing an oil reservoir and an inner chamber for a roller bearing partitions extending essentially in the radial direction with respect to the bearing axis separating the chambers, each of said partitions including a part which is removably attached to the bearing housing and is centered in a bore in the bearing housing coaxial to the support of the shaft, an oil lubricator ring resting on the shaft in the inner chamber or on a part revolving with the shaft and projecting through recesses in one of the partitions into the oil reservoir, said lubricator ring transporting oil out of the oil reservoir into the inner chamber as the shaft turns, at least one of said partitions (**4, 5**) having in the lower area a skirt-like extension (**25**), which extends down toward the floor (**26**) of the oil reservoir (**6**) to form a narrow gap and divides the oil reservoir into two axially sequential chambers (**6, 27**), said partitions (**4, 5**) being axially adjustable in the bore (**3**) of the bearing housing (**1, 2**) to accommodate various sized race rings.

4,619,536
PRINTING HAMMER ASSEMBLY

Takeshi Takemoto, Yamato, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Sep. 28, 1983, Ser. No. 536,906
Claims priority, application Japan, Sep. 29, 1982, 57-170703
Int. Cl.[4] B41J *9/38, 9/42*
U.S. Cl. 400—157.2 **16 Claims**

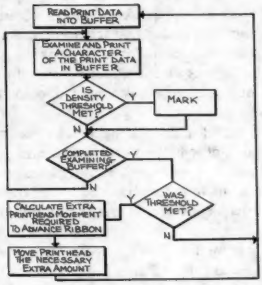


1. A printing hammer assembly comprising:
a printing hammer having an impact surface and a magnetically interacting means;
means for supporting said printing hammer slidably movable along the longitudinal axis of said printing hammer;
biasing means for normally biasing said printing hammer in a backward direction along said longitudinal axis to a retracted position;
means for producing a magnetic flux passing through said magnetically interacting means of said printing hammer when energized, thereby causing said printing hammer to move in a forward direction along said longitudinal axis against the bias force of said biasing means;
means for providing a first surface which defines said retracted position of said printing hammer, said means for providing a first surface including a rear yoke having a rear end surface at least a part of which defines said first surface facing in said backward direction with respect to the return movement of said printing hammer along said longitudinal axis to said retracted position;
stopper means normally pressed against said first surface and having a second surface normally located in registry with said first surface, said second surface being contactable with said printing hammer to position said printing hammer at said retracted position; and
means for holding said stopper means normally pressed against said first surface.

4,619,537
RIBBON FEED WITH INK DEPLETION COMPENSATION

Phuc K. Do; Carol E. Wyke; Barnes R. Kendrick, Jr., all of Charlotte; Dennis R. Hedrick, High Point, and Demetrios Troupes, Charlotte, all of N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 23, 1985, Ser. No. 737,187
Int. Cl.[4] B41J *33/14, 33/36*
U.S. Cl. 400—225 **14 Claims**



1. A printer for printing data on a print medium comprising
a print head mounted for movement relative to a print medium;
a supply of ink ribbon, including a span of ink ribbon which is interposed between said print head and the print medium;
means for moving said print head and for advancing ink ribbon from said supply into said span in response to movement of the print head in at least one direction; and
control means for directing print data to said print head and controlling movement of the print head;
said control means including means for detecting when the printing density exceeds a predetermined value; and
means repsonsive to said predetermined value being exceeded for moving said print head an amount greater than that necessary to position the print head at a succeeding print position so as to thereby cause additional ink ribbon to be advanced from said supply and avoid overprinting

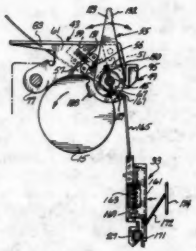
on areas of the ink ribbon where high density printing has occurred.

4,619,538

ADJUSTABLE LOAD, FRICTION FEED, QUICK TEAR BAR MECHANISM

Richard G. Patterson, Bellevue, Wash., assignor to Mannesmann Tally Corporation, Kent, Wash.

Filed Feb. 4, 1985, Ser. No. 697,955
Int. Cl.[4] B41J *11/66, 11/32;* B26D *7/06*
U.S. Cl. 400—621 **8 Claims**



1. An adjustable load, quick tear bar mechanism for a printer having a cylindrical platen that friction feeds a print receiving medium through the printer and provides support for the print receiving medium as said medium is printed on by the actuation of a print head, said adjustable load, quick tear bar mechanism comprising:

(a) arm means for supporting a tear bar, said arm means comprising at least two arms positioned at opposite ends of said platen so as to overlie said platen, each of said arms including an upstream end and a downstream end, the downstream ends of said arms being pivotally attached to said printer;

(b) a tear bar mounted on the upstream ends of said arms for pressing said print receiving medium against said platen;

(c) a plurality of rollers and a roller shaft, said rollers being mounted on said roller shaft and said roller shaft being mounted between the upstream ends of said arms; and,

(d) controllable pressure means for applying pressure to the upstream ends of said arms and said tear bar to control the pressing force applied by said tear bar to said print receiving medium such that said tear bar continues to press said print receiving medium against said platen when a manual force adequate to separate said print receiving medium at said tear bar is applied to said print receiving medium downstream of said tear bar, said controllable pressure means including:

(1) coil spring means having one end attached to said printer and the other end attached to the ends of said roller shaft; and,

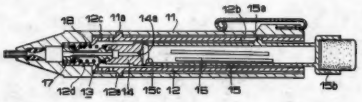
(2) hook means mounted on said roller shaft so as to rotate with said roller shaft, said hook means including hooks connectable to said coil spring means such that said coil spring means apply pressure to said roller shaft and, thus, said rollers, via said hook means.

4,619,539

MECHANICAL PENCIL EQUIPPED WITH LEAD-STORING CARTRIDGE

Hidehei Kageyama, Kawagoe, Japan, assignor to Kotobuki & Co, Ltd., Kyoto, Japan

Filed Aug. 14, 1984, Ser. No. 640,992
Claims priority, application Japan, Feb. 13, 1984, 59-17501[U]; Feb. 13, 1984, 59-17502[U]
Int. Cl.[4] B43K *21/00*
U.S. Cl. 401—85 **2 Claims**



1. A mechanical pencil comprising:

(a) a barrel to be held by a user;

(b) an inner sleeve removably held in place in said barrel;

(c) a lead-feeding mechanism separate from and contained within said inner sleeve;

(d) a lead guide abutting against said lead-feeding mechanism;

(e) a lead-containing cartridge having an outer diameter substantially equal to the inner diameter of one of said barrel or said inner sleeve and held detachably in said barrel;

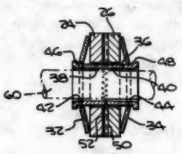
wherein said barrel defines an interlocking slot therethrough, said inner sleeve has a projection on the outer surface thereof, and when assembled, said projection is brought into engagement with the interlocking slot so as to interlock said inner sleeve and said barrel together.

4,619,540

SPRING PIVOT JOINT FOR MANNEQUIN

Robert L. Day, Sun Valley, and Robert H. Day, Burbank, both of Calif., assignors to S.D.S. Industries, Inc., Pacoima, Calif.

Filed Jul. 20, 1984, Ser. No. 632,891
Int. Cl.[4] F16D *1/12, 3/00*
U.S. Cl. 403—24 **1 Claim**



1. A pair of parts to be joined together for pivotal movement, the combination therewith of

(1) a plurality of spring pivots, each spring pivot including:

a. a pair of pivot plates in face to face contact, and each plate having a wing or tab for attachment to the parts respectively;

b. a pair of Belville spring washers encompassing said pivot plates;

c. a hollow rivet extending through aligned holes in said pivot plates and said spring washers, said rivet having heads confining said parts in a stack and loading said spring washers so that substantial frictional resistance is imposed against relative angular movement of said parts;

d. said attaching wings or tabs extending radially beyond said spring washers; and

(2) a rod extending in slidably fitted relationship through the hollow rivets to hold said spring pivots in coaxial relation-

ship while said wings or tabs are attached to said parts, said rod being slidably removable from said spring pivots; (3) said spring pivots being joined to each other only through said parts when said rod is removed; said spring pivots confining said parts for angular movement about the common axis of said spring pivots.

4,619,541

BUILDERS SCAFFOLDING

Dennis W. Lovering, Wolverhampton, United Kingdom, assignor to GKN Kwikform Limited, London, England

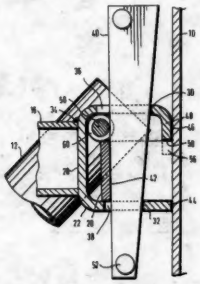
PCT No. PCT/GB84/00336, § 371 Date May 20, 1985, § 102(e) Date May 20, 1985, PCT Pub. No. WO85/01770, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 2, 1984, Ser. No. 740,844

Claims priority, application United Kingdom, Oct. 8, 1983, 8326991

Int. Cl.[4] E04G *7/00*; F16B *7/00*

U.S. Cl. 403—49 **8 Claims**



1. A releasably engageable builders scaffolding assembly comprising an upright member, a brace member, a cross member and connecting means for detachably securing the upright member and cross member together, the connecting means comprising a socket mounted on the exterior of the upright member and being open at each of its two opposite ends which are spaced apart along the length of the upright member, and a connector at one end of the cross member including two limbs which are spaced apart vertically to permit the socket to be received therebetween, each limb having a respective abutment face to abut the upright member, each limb further being provided with a respective opening which receives a wedge clamping member forming part of the connecting means;

characterized in that the brace member is provided at one end thereof with a spigot extending perpendicularly therefrom, said spigot having a recess extending circumferentially thereof wherein an edge of the wedge clamping member is engageable to retain said spigot between the connector and an adjacent part of the socket, whereby said upright member, said brace member and said cross member are all releasably engaged together to form said assembly.

4,619,542

BABY CARRIAGE GRIP ROD LOCKING MECHANISM

Kenzou Kassai, Osaka, Japan, assignor to Aprica Kassai Kabushikikaisha, Osaka, Japan

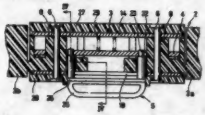
Filed Mar. 15, 1985, Ser. No. 712,707

Claims priority, application Japan, Mar. 23, 1984, 59-56718

Int. Cl.[4] F16C *11/00*; F16D *1/00*

U.S. Cl. 403—62 **9 Claims**

1. A locking mechanism for a baby carriage grip rod interconnecting a pair of push rods (1) of a foldable baby carriage, comprising coupling means including two parallel shafts (6) for foldably interconnecting two portions (2*a*, 2*b*) into which said grip rod (2) is divided and supported for rotation around said shafts (6) each grip rod portion (2*a*, 2*b*) having a boss (8) with a hole (7) through which the respective shaft (6) extends, two locking recesses (12) each formed in one lateral surface of an end section of the respective one of said grip rod portions, said locking recesses extending in a plane intersecting said parallel shafts, a locking plate (4) guided at each end by said respective boss for moving axially relative to said shafts, said locking



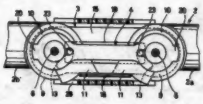


plate being capable of simultaneously fitting into both locking recesses for locking said portions (2*a*, 2*b*) of said grip rod in a single straight locked state, a spring (29) for urging said locking plate in the direction in which it fits in said locking recesses for automatically maintaining said locked state, and an unlocking member (5) for imparting an operating force for disengaging said locking plate from said locking recesses against the force of said spring.

4,619,543

COUPLING ASSEMBLY HAVING A RETAINER PLATE FOR GUIDING A COUPLING HOOK

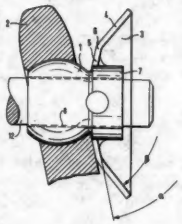
Jürgen Vollmer, and Alfred Frackenpohl, both of Lohmar, Fed. Rep. of Germany, assignors to Jean Walterscheid GmbH, Lohmar, Fed. Rep. of Germany

Filed Mar. 20, 1985, Ser. No. 713,784

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1984, 3410314

Int. Cl.[4] F16C *11/06*; F16D *3/10*

U.S. Cl. 403—114 **1 Claim**



1. A coupling assembly for an agricultural attachment or trailer implement comprising:

a coupling member including a coupling sphere adapted to be connected by sliding engagement over a coupling bolt;

a coupling hook adapted to be connected with said coupling bolt by engagement over said coupling sphere; and

an annular retainer plate affixed to said coupling member adjacent said coupling sphere for guiding and retaining said coupling hook on said coupling sphere, said retainer plate comprising

a radially innermost support region affixed contiguously

with said coupling member having a conical configuration opening away from said coupling sphere and having an opening angle of about 156°,

a radially innermost guide region formed integrally with said support region and arranged peripherally thereabout opening away from said coupling sphere with an opening angle of less than 120°, with said support region extending radially through about one-third of the total radial width of said annular retainer plate.

4,619,544

BUSHINGS

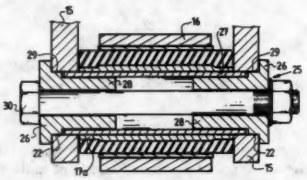
Peter Laidely, 31 Dibley Street, Wooloongabba, 4012 Queensland, Australia

Filed Oct. 28, 1983, Ser. No. 546,398

Claims priority, application Australia, Nov. 1, 1982, PF6606

Int. Cl.⁴ F16C *11/06*

U.S. Cl. 403—162 **9 Claims**



1. In an assembly for supporting an eye member or the like, having an aperture therein, between a pair of spaced supporting members at respective supporting apertures therein for relative pivotal movement, a bushing comprising support sleeve means of rigid material extending through the aperture in the eye member in supporting relationship therewith and between the supporting members with at least one end of said support sleeve means extending only part way into a respective supporting aperture for supporting engagement therewith, a pair of end plug means for holding said support sleeve means between the supporting members, and tensionable connector means passing through said end plug means and said support sleeve means for securing each end plug means in respective supporting apertures of the supporting members, at least the end plug means at said one end of said support sleeve means including an outer end portion engaging the outer side of the respective supporting member, an inner end portion within said support sleeve means for supporting engagement therewith, and an intermediate portion between said outer and inner end portions extending only part way into the respective supporting aperture short of said one end of said support sleeve means.

4,619,545

FRAME ASSEMBLY

Valentin Küttenbaum, Ringelhauser Allee 14, D-7958 Laupheim, Fed. Rep. of Germany

Continuation of Ser. No. 487,120, Apr. 21, 1983, abandoned. This application Nov. 21, 1985, Ser. No. 800,364

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1982, 3215018

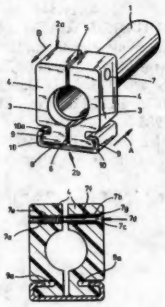
Int. Cl.⁴ F16B *7/04*; F16D *1/06*

U.S. Cl. 403—169 **11 Claims**

1. A device for releasably connecting an elongated frame element to a generally stationary support, the device comprising:

a pair of like elongated clamping jaws extending generally parallel to and spaced from each other, having inner and outer ends, and formed with confronting recesses embracing the element with the jaws separated by inner and outer slits extending oppositely from the recesses toward the respective ends of the jaws, the outer ends of the jaws being formed with respective oppositely directed ribs;

traction means connected between the inner ends of the jaws for drawing the jaws together at the inner slit while urging the jaws and ribs apart at the outer slit and for thereby clamping the element between the jaws;



a bridge having a pair of sides one of which is formed with a pair of confronting and relatively nondisplaceable hooks engaging over the ribs, whereby spreading of the jaws at the ribs engages the jaws tightly in the bridge; and

means for securing the other side of the bridge releasably to the support.

4,619,546

JUTTED JOINT STRUCTURES

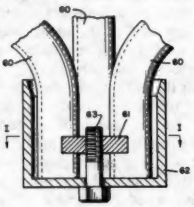
Hans-Josef Schlippes, 325 Bord de L'Eau, Ste. Dorothee, Laval P. Q., Canada (H7X 1S8)

Filed Oct. 29, 1984, Ser. No. 665,633

Claims priority, application Canada, Nov. 14, 1983, 1171231

Int. Cl.⁴ F16B *11/00*; F16D *3/00*

U.S. Cl. 403—171 **9 Claims**



1. An apparatus for joining together multiple pieces of structure comprising:

elongated members;

said elongated members have angled end portions;

indexing means, interposed between recessed surfaces provided in said end portions of said elongated members in order to form a joint and to secure the alignment of said joint and to prevent shifting in any direction;

said elongated members, positioned in radial orientation towards the center of said joint with said angled end portions parallel side by side in a circular configuration;

said angled end portions being maintained in engaged juxtaposition to each other;

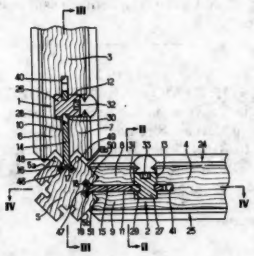
retaining means; and

said retaining means, surrounding portions of said elongated members to hold them in their assembled position.

4,619,547
DEVICE FOR ASSEMBLING CONSTRUCTION ELEMENTS, NOTABLY CONSTRUCTION ELEMENTS MADE OF WOOD

Louis A. Renaud-Goud, Le Malod Avressieux, 73240 Saint Genix sur Guiers, France

Filed Apr. 24, 1984, Ser. No. 602,785
Claims priority, application France, Apr. 28, 1983, 83 07046
Int. Cl.⁴ F16B *7/04, 12/44*
U.S. Cl. 403—231 **10 Claims**



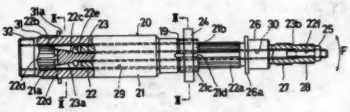
1. A device for connecting a first construction element having a connecting end to a second construction element extending at right angles thereto, said first element having a longitudinal web-receiving recess at said connecting end and a lateral pin-receiving recess extending transversely to said web-receiving recess, said second element having two longitudinal flanges forming a longitudinal groove therebetween, said groove being V-shaped and being formed of two arms, said device comprising a tie piece having a web portion which is slidable in said web-receiving recess of the said first construction element, said tie piece having an end portion which is located outside the said web-receiving recess of the said first construction element, said end portion having two oppositely projecting lateral ribs which are received in the longitudinal groove of said second element, a pin which is receivable in the pin-receiving recess in the first element, said tie piece having a transvere passage formed therein, said pin running laterally to the web-receiving recess and having an eccentric portion entering said transverse passage in the web portion of the tie piece so that rotation of the pin in the transverse pin-receiving recess moves the tie piece into the said web-receiving recess to clamp the longitudinal flanges of the second element between the ribs of the tie piece and the end of the first element in order to hold the construction elements in assembled relation, the web and the two lateral ribs on the tie piece forming a Y, the longitudinal groove of the said second element being shaped complementary to the Y-shaped end portion of the tie piece, each of said longitudinal flanges of the second element forming longitudinal rib means adjacent to said V-shaped groove, each of said longitudinal rib means of the second element having two exposed faces which lie substantially parallel to the arms of said V-shaped groove, thereby providing the longitudinal rib means with an exposed V-shaped surface for entering complementary shaped grooves in the end of the first element adjacent to its longitudinal recess receiving the web of the tie piece.

8. A device for connecting a first construction element to a second construction element, said first element having a web-receiving recess and a lateral pin-receiving recess said second element having a longitudinal groove bounding two longitudinal flanges, comprising, a tie piece having a web portion which is slidable in said web-receiving recess of the said first construction element, said tie piece having an end portion which is located outside said web-receiving recess and has two oppositely projecting lateral ribs which are received in the longitudinal groove of said second element, a pin which is receivable in the pin-receiving recess in the first element, said pin running laterally to the web-receiving recess and having an eccentric portion entering a transverse passage in the web portion of the tie piece whereby rotation of the pin in the transverse pin-receiving recess moves the tie piece into the said web-receiving recess to clamp the longitudinal flanges of the second element between the ribs of the tie piece and the first element in order to hold the construction elements in assembled relation, characterized in that the web and the two lateral ribs on the tie piece form a Y, and the longitudinal groove of said second element is V-shaped, said pin including two cylindrical portions separated by a cylindrical eccentric portion, said transverse passage of the said tie piece being cylindrical so as to receive the cylindrical portions of the pin on each side of the web-receiving recess, said transverse passage of the tie piece having, in the direction of tie piece movement, an inwardly projecting portion which is engageable with the eccentric portion of the pin so that, by rotating the pin, the tie piece can be moved outward from the web-receiving recess, one of the cylindrical portions of the pin having a longitudinal groove (61) which permits this grooved cylindrical portion to pass through the transverse passage of the tie piece until the eccentric portion of the pin is located in this transverse passage.

4,619,548
TELESCOPIC SHAFT

Kenichi Kazaoka; Masanobu Ishikawa, and Masumi Nishikawa, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Feb. 8, 1985, Ser. No. 700,132
Claims priority, application Japan, Mar. 5, 1984, 59-042492
Int. Cl.⁴ F16B *2/02, 7/00*
U.S. Cl. 403—290 **10 Claims**



1. A telescopic shaft comprising:
an integral outer shaft, the outer shaft having an integral first inserted end portion and a second end portion;
first spline means on the outer shaft;
an integral inner shaft, the inner shaft having an integral first inserting end portion and a second end portion;
second spline means on the inner shaft for engagement with the first spline means;
first depressing means for depressing and contracting the first inserted end portion of the outer shaft against the inner shaft; and
second depressing means for depressing and expanding the first inserting end portion of the inner shaft against the outer shaft, wherein the second depressing means includes a rod extending through the second end of the inner shaft, the inner shaft including an inner circumferential surface for accommodating the rod.

4,619,549
SCAFFOLDING CONNECTION APPARATUS AND METHOD

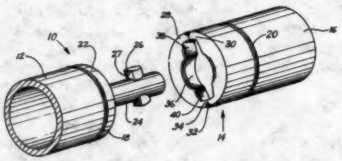
William E. Gilbreth, Huffman, Tex., assignor to Builders Equipment and Tool Manufacturing Company, Houston, Tex.

Filed Nov. 13, 1984, Ser. No. 670,042
Int. Cl.⁴ B25G *3/16;* **F16B** *7/20*
U.S. Cl. 403—349 **16 Claims**

1. A scaffolding support including first and second tubular members adapted for axial alignment to form an elongate tubular support member, the improvement comprising:
a forged-construction male interconnection component having at least one outwardly projecting dog member;
a forged-construction female interconnection component

having a male-receiving receptacle and a substantially circular front end surface adapted for sliding engagement along a periphery of said male component;

said female interconnection including first and second portions joined together by a welding, each portion having a substantially C-shaped cross-sectional configuration and a



tapered dog engaging surface selectively positioned on said portion for engaging said at least one dog member;

said male component being weldedly affixed about its periphery to said first tubular member; and

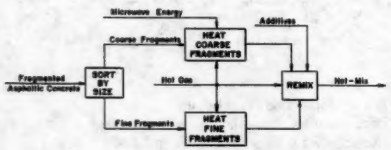
said female component being weldedly affixed about its periphery to said second tubular member.

4,619,550

MICROWAVE METHOD AND APPARATUS FOR HEATING LOOSE PAVING MATERIALS

Morris R. Jeppson, Carmel, Calif., assignor to CD High Technology, Inc., Georgetown, Tex.

Filed Oct. 5, 1984, Ser. No. 658,122
Int. Cl.[4] E01C *23/14, 19/18*
U.S. Cl. 404—80 **24 Claims**



1. A method of recycling fragments of asphaltic concrete or the like comprising the steps:

sorting said fragments on the basis of size to separate coarse fragments exceeding a predetermined size from fine fragments of lesser size,

separately heating the coarse and fine fragments with different heating procedures by directing said fine fragments to a first location and heating said fine fragments thereat at least primarily by exposure to hot gas, and by directing said coarse fragments to a second separate location and heating said coarse fragments thereat at least primarily by directing microwave energy into said coarse fragments to generate heat internally therein,

recombining said fine and coarse fragments following said separate heating of said coarse fragments, and

mixing said recombined fine and coarse fragments while in the heated condition to provide new hot-mix.

11. In a hot-mix plant, the combination comprising:

a rotary drum-mixer having a first stage with a new aggregates receiving port and a second stage with a reclaimed material port for receiving fragmented old asphaltic concrete or the like for intermixing with material heated in said first stage,

means for establishing a hot gas flow within said drum-mixer,

means for selectively feeding new aggregates into said new aggregates receiving port,

a sorter for separating large fragments of said old asphaltic concrete or the like that exceed a predetermined size from small fragments which are of lesser size,

a microwave heating chamber, and

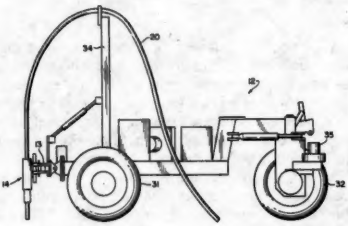
a conveyor system interconnecting said drum-mixer and said sorter and said microwave heating chamber and having means for carrying said small fragments from said sorter to said reclaimed material port of said drum-mixer, means for carrying said large fragments from said sorter to said microwave heating chamber, and means for recombining said large fragments with said small fragments following heating of said large fragments in said microwave heating chamber.

4,619,551

DEVICE FOR REMOVING DEGRADED CONCRETE

Hans Juan, la Conversion, Switzerland; Jan Å. Bjerngren, Sollentuna, and Carl Å. Strömdahl, Stockholm, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Mar. 14, 1985, Ser. No. 711,967
Claims priority, application Sweden, Mar. 27, 1984, 8401687
Int. Cl.[4] E01C *23/10*
U.S. Cl. 404—90 **2 Claims**



1. A device for removing degraded concrete from the surface of a concrete layer, comprising:

a carrier constructed for movement over the concrete layer;

a source of high-pressure fluid associated with said carrier;

a nozzle guide assembly disposed on said carrier;

a nozzle device including a non-cavitating nozzle fixed to said guide assembly and in fluid communication with said high-pressure fluid source, wherein the nozzle guide assembly guides said nozzle device along a predetermined path at a substantially constant distance above the concrete layer while a high-pressure fluid jet from said non-cavitating nozzle impacts the surface of the concrete layer;

said nozzle device including means for supporting said non-cavitating nozzle so that the axis of the nozzle is inclined at a fixed angle in the range of 30° to 60° relative to the concrete layer and said nozzle points in the direction in which it is guided by said guide assembly;

wherein accumulation of already dislodged surface particles in front of the surface to be impacted by said high-pressure fluid jet is substantially reduced relative to accumulation of said particles when the nozzle axis is perpendicular to the concrete layer.

4,619,552

VIBRATION PROOF SUSPENSION TYPE VIBRATING ROLLER

Hisanori Sadahiro, Kawagoe, Japan, assignor to Sakai Heavy Industries Ltd., Tokyo, Japan

Filed Aug. 6, 1984, Ser. No. 638,117
Int. Cl.[4] E01C *19/28*
U.S. Cl. 404—117 **9 Claims**

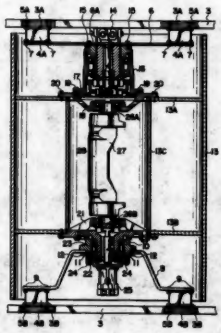
1. A vibrating roller comprising:

a frame structure having first and second sides; and

a vibratory roller including,

a roller of generally cylindrical shape having first and second ends, and being supported in said frame structure, said roller including a plate member disposed at said first end of said roller, said plate member having a first side closer to said frame and a second side further from said frame,

a plurality of substantially vibration proof members directly fixed to both of said sides of said frame structure and securing both of said ends of said roller so as to enable said roller to be rotatably supported by said frame structure via said members, said vibration proof members securing said first end of said roller, being attached to said first side of said plate member,



a first hydraulic motor for rotating said vibratory roller, being mounted on said first side of said frame structure and on said first side of said plate member, said first hydraulic motor having a drive gear mechanism including a housing located on and fixed to said second side of said plate member,

a vibration generating shaft having an eccentric mass secured thereto, and being generally located along the longitudinal axis of said roller, and

a second hydraulic motor for rotating said vibration generating shaft, being mounted on said second side of said frame structure.

4,619,553

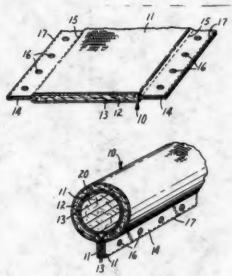
HIGH TEMPERATURE OIL BOOM COVER BLANKET

Edward M. Fischer, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Apr. 24, 1985, Ser. No. 726,519

Int. Cl.[4] A62C *1/00*; B32B *1/08, 18/00*; E02B *15/04*

U.S. Cl. 405—63 **7 Claims**



1. A high temperature oil containment boom cover blanket comprising, in laminar combination, a top layer of a polymer coated open mesh high temperature resistant refractory fabric, a middle layer of a high temperature resistant refractory fibrous batt and a bottom layer of a woven fabric, said cover blanket being unified by having at least said top layer and said bottom layer secured together along their longitudinal edges.

7. A high temperature oil containment boom capable of sustained exposure to flames with temperatures in the order of 1100° C. comprising, in combination, an elongated cylindrical oil containment boom enveloped by the cover blanket of claim **6** such that the elongated cylindrical oil containment boom is not directly exposed to said flames.

4,619,554

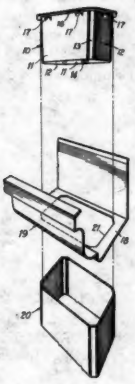
GUTTER OUTLET TUBE

Landis C. Walker, 72 Crystal River Dr., Riverdale, Ga. 30274, and Marcus J. Bailey, 1217 Lanier Blvd., Atlanta, Ga. 30306

Filed Aug. 15, 1984, Ser. No. 641,183

Int. Cl.[4] E04D *13/08*

U.S. Cl. 405—120 **5 Claims**



1. In a connection for a gutter and downspout, the gutter having a flat bottom wall provided with a generally rectangular opening in alignment with the top of the downspout, a gutter outlet tube comprising a generally flat, arcuate blank member foldable into a generally octagonal, inwardly tapering tube body having four side walls and corner web portions for connecting said side walls for projecting downwardly through the rectangular opening and into the downspout, an integral, continuously formed, top marginal support flange on said tube body for sealing engagement with the gutter bottom wall, and integrally formed outstruck downwardly tapering lock lugs on said four side walls at a common elevation closely below said flange and spaced therefrom a distance approximating the thickness of the gutter bottom wall.

4,619,555

SLIPLINE ADJUSTABLE MANHOLE SEAL

Harry W. Skinner; James W. Skinner, both of Fort Wayne, Ind.; William O. Skinner, Baraboo, Wis., and William P. O'Donnell, Wilmington, Del., assignors to Press-Seal Gasket Corporation, Fort Wayne, Ind.

Filed Aug. 27, 1984, Ser. No. 644,387

Int. Cl.[4] F16L *1/00*

U.S. Cl. 405—154 **15 Claims**

1. The method of retrofitting an in-ground drainage system with a drain pipe liner comprising the steps of:

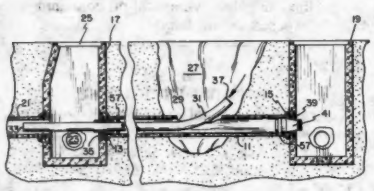
providing an elongated access opening in an existing drain pipe;

providing a flexible sleeve-like gasket;

sealing a circumferential end portion of the outer surface of said flexible sleeve-like gasket to the drain pipe inner surface to provide a first seal;

feeding a flexible liner into the access opening along the drain pipe and through said gasket until the liner lead end reaches a drain pipe accessible end; and

sealing a circumferential end portion of the inner surface of said flexible sleeve-like gasket to the flexible liner outer surface near the lead end thereof and adjacent said drain



pipe accessible end to provide a second seal, said first and second seals being separated somewhat along the common axis of elongation of the drain pipe and liner, whereby a body portion of said sleeve-like gasket between said seals is free to flex to accommodate any expansion and contraction of said liner.

4,619,556

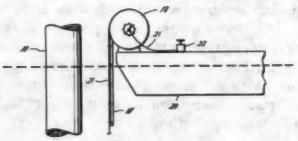
METHOD AND APPARATUS FOR SEVERING A TUBULAR MEMBER

Ernest P. Parra, 1909 Laredo Dr., Houma, La. 70360

Filed Nov. 14, 1983, Ser. No. 550,821

Int. Cl.[4] E02D *5/32, 7/24, 9/04*

U.S. Cl. 405—195 **25 Claims**



1. Apparatus for use in severing a tubular member at a desired level beneath an underwater surface from which the tubular member extends, said apparatus comprising an assembly adapted to be disposed about the tubular member at the underwater surface and including means for severing the tubular member, and means through which fluid may be jetted for scouring the underwater surface about the tubular member in order that the assembly may move downwardly about the tubular member, under its own weight, and remotely operable means for jetting fluid from the scouring means, until the severing means has been lowered with the assembly to the desired level, and for operating the severing means to sever the tubular member when so lowered.

4,619,557

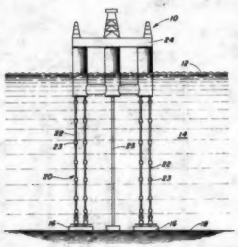
CORROSION PROTECTION FOR MOORING AND RISER ELEMENTS OF A TENSION LEG PLATFORM

Mamdouh M. Salama, Ponca City, Okla.; Roderick J. Myers, Esher, United Kingdom; William H. Thomason, and Michael H. Joosten, both of Ponca City, Okla., assignors to Conoco Inc., Ponca City, Okla.

Filed May 2, 1984, Ser. No. 606,023

Int. Cl.[4] E02B *17/00;* **C23F** *13/00*

U.S. Cl. 405—211 **3 Claims**



1. In a tension leg platform for marine drilling and production of subsea hydrocarbons wherein substantially vertical high strength steel tubular elements are continuously submerged in sea water and constantly maintained in tension between subsea anchoring means and a floating platform by excess buoyancy of said platform, the improvement which comprises said tubular elements being cathodically protected by a coating of flame sprayed aluminum applied to substantially the entirety of an exposed outer surface of said substantially vertical, continuously submerged, tensioned tubular elements, said coating of flame sprayed aluminum having a mean thickness of at least about 200 microns and an adhesive bond strength of about 7 MPa.

4,619,558

APPARATUS FOR PRODUCING IN-SITU CONCRETED PILES WITH ENLARGED BASES

Ian H. Braatvedt, Liege, Belgium, assignor to Compagnie Internationale des Pieux Armes Frankignoul, Liege, Belgium

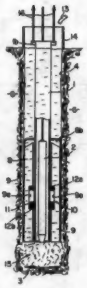
Division of Ser. No. 545,946, Oct. 27, 1983, Pat. No. 4,544,515.

This application Aug. 8, 1985, Ser. No. 763,816

Claims priority, application United Kingdom, Nov. 5, 1982, 8231681

Int. Cl.[4] E02D *5/44*

U.S. Cl. 405—237 **5 Claims**



1. An apparatus for producing a concrete pile in the ground with an enlarged base, comprising: a tube having a diameter, an upper end and a lower end; a shoe provided at said lower end

of said tube and having a larger diameter than said tube so as to form a gap between said tube and the ground; a longitudinal outer casing fitable over said tube, and having a diameter substantially equal to said shoe diameter so as to define a space between said tube and said outer casing, said casing also having a lower end attached to said shoe, and an open upper end formed so as to allow a free flow of concrete into said space between said tube and said outer casing; a sliding joint provided so as to slidably attach said outer casing to said tube so that a predetermined length of sliding exists between said tube and said outer casing; a pile having a free-falling hammer, said tube, with said outer casing attached, being drivable into the ground by said pile to a depth greater than the length of said outer casing so as to form an opening in the ground and define said gap between said tube and the ground; means for supplying concrete to said gap and said space so that said gap and said space are fillable with concrete as said tube with said attached outer casing is driven into the ground; means for expelling said shoe from said lower end of said tube and said outer casing, along with some of the concrete, so as to form the enlarged base; and a traction cable attached to said upper end of said tube so that said tube is raiseable from said shoe after the enlarged base is formed so as to cause said tube to slide upwardly with respect to said outer casing, thereby allowing concrete from said space to enter the volume of space previously occupied by the lower end of said tube, said tube being raiseable to a point where both said tube and said outer casing are removable from the ground so that the concrete from said gap and said space fills the resulting opening.

4,619,559

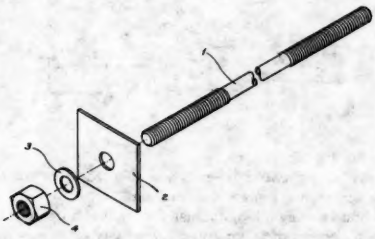
ROCK BOLTING

Colin Norris, Tarro, Australia, assignor to The Titan Manufacturing Co. Pty. Ltd., New South Wales, Australia

Continuation of Ser. No. 622,858, Jun. 21, 1984, abandoned, which is a continuation of Ser. No. 417,945, Sep. 14, 1982, abandoned, which is a continuation of Ser. No. 214,895, Dec. 9, 1980, abandoned. This application Apr. 15, 1985, Ser. No. 723,554

Int. Cl.[4] E21D *21/00*; F16B *43/00*

U.S. Cl. 405—259 **14 Claims**



1. In a method of reinforcing a rock face with at least one rock bolt, said method comprising:

drilling a hole in the rock face,

inserting a rock bolt having at least one threaded end into the hole so that a threaded free end thereof protrudes from the hole,

anchoring the other end of the rock bolt into the hole,

placing a plate washer over the threaded free end of the bolt,

engaging a nut with the threaded free end, and

tightening the nut to force the plate washer against the rock face to induce a tension in the rock bolt,

the improvement comprising:

reducing the coefficient of friction between the plate washer and the nut by placing a friction-reducing disc over the free end of the rock bolt before the nut is engaged therewith, so that the friction-reducing disc is located between the plate washer and the nut, wherein the friction-reducing disc is made of a material having a lower coefficient of friction with at least one of the plate washer and the nut than the coefficient of friction between the plate washer and the nut.

4,619,560

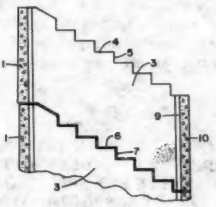
STRUCTURAL MODULE FOR RETAINING WALLS AND THE LIKE

Edward V. Crinnion, 15 Brookridge Dr., and James S. Crinnion, 75 Avonwood Rd., Apt. B6, both of Avon, Conn. 06001

Filed Feb. 8, 1984, Ser. No. 578,352

Int. Cl.[4] E02D *5/20*

U.S. Cl. 405—284 **50 Claims**



1. A prefabricated cellular module which, when placed in vertical and horizontal relationship with appropriately proportioned like modules, is used in constructing retaining walls, sea walls, and the like, said module comprising (a) a front panel, (b) a rear panel, (c) at least one vertically oriented partition means connecting said front panel and said rear panel, wherein, for a substantial length of said partition means the thickness of said partition means is substantially less than the overall width of the module, thereby creating at least one cellular chamber with vertical through-opening(s), and (d) said partition means, and said front panel and said rear panel being rigidly interconnected in a geometrical relationship such that, when the module is in its erected position in a wall structure, the uppermost and lowermost surfaces of said partition means are each disposed downwardly from said front panel at an angle, as measured from a line perpendicular to the plane of the front face of said wall structure, so that the bottom edge of said rear panel is situated at an elevation substantially below a line extending from the lower edge of said front panel perpendicular to the plane of the front face of said wall structure.

4,619,561

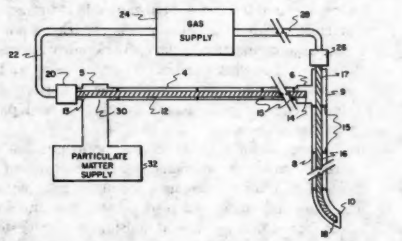
METHOD AND APPARATUS FOR CONVEYING PARTICULATE MATTER

Jay Perkins, Springville, Utah, assignor to Pacific States Cast Iron Pipe Co., Provo, Utah

Filed Aug. 20, 1985, Ser. No. 767,368

Int. Cl.[4] B65G *53/18*

U.S. Cl. 406—89 **15 Claims**



1. Apparatus for conveying particulate matter comprising

an elongate conduit for carrying particulate matter and having an input end and a discharge end,

an opening at or near the input end of the conduit for introducing particulate matter into the conduit, and an opening at or near the discharge end of the conduit for discharging particulate matter,

a tightly wound coiled wire spring formed into a tube and disposed inside the conduit to extend substantially the length of the conduit, said wire spring having a proximal end generally coincident with the input end of the conduit and a distal end generally coincident with the discharge end of the conduit, and

means for supplying gas under pressure to the proximal end of the coiled wire spring so that the gas travels along the inside of wire spring toward the distal end and out between the wire coils in a spiral-like fashion to carry particulate matter toward the discharge end of the conduit.

4,619,562

PNEUMATIC TRANSPORTATION SYSTEM FOR POWDERED OR GRANULAR MATERIAL WITH A SWITCHING VALVE FOR SELECTION OF DIFFERENT TRANSPORT PATHS

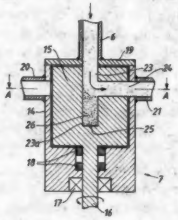
Roine Brännström, Finspong, Sweden, assignor to Asea Stal AB, Västerås, Sweden

Filed Oct. 24, 1984, Ser. No. 664,174

Claims priority, application Sweden, Oct. 31, 1983, 8305967

Int. Cl.[4] B65G *53/56*

U.S. Cl. 406—182 **16 Claims**



1. A switching valve for selection of different paths for a flow of particulate material, such as powdered and granular materials, when transported by a gas in a pneumatic transport system for the particulate material, said switching valve comprising:

a housing with connections for an upstream conduit and a plurality of downstream conduits;

a rotor arranged for rotation within said housing and having radially extending surfaces axially opposite each other and a compartment with an open end at one radial surface facing the mouth of said upstream conduit connection, a closed end toward the opposite radial surface, a radial extension within the rotor forming at least a portion of a discharge connection between the compartment and any one of said downstream conduit connections, and an axial extension within the rotor forming a blind space at its closed end for providing a cushion of said particulate material;

driving means for rotating said rotor to position said discharge connection to open out said compartment into any one of said of downstream conduit connections; and,

means for supporting said rotor at said opposite radial surface for rotation within said housing, the axial extension of said compartment within said rotor having a sidewall with a radial thickness at least substantially equal to the radial extent of the radial extension of said compartment.

4,619,563

DIAMOND TOOL

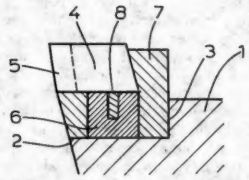
Jan Doting, Nijmegen, Netherlands, assignor to D. Drukker & Zn. N.V., Amsterdam, Netherlands

Filed Jul. 18, 1984, Ser. No. 632,128

Claims priority, application Netherlands, Aug. 4, 1983, 8302757; European Pat. Off., Nov. 7, 1984, 0133716

Int. Cl.[4] B23P *15/28*; B26D *7/00*

U.S. Cl. 407—118 **7 Claims**



1. A diamond tool comprising a diamond with a cutting edge, a metal connecting block and a tool shaft with a front end, the diamond being brazed to the metal connecting block which together with the diamond is encased in a sinter mass which is brazed to the front end of the tool shaft, wherein the connecting block at its side opposite of the diamond has a brazing face lying free of the sinter mass also being fixedly brazed to the front end of the tool shaft.

4,619,564

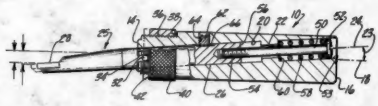
BORING BAR

Mark E. Jacobson, Troy, Mich., assignor to MLS, Inc., Troy, Mich.

Filed Jun. 12, 1985, Ser. No. 744,029

Int. Cl.[4] B23B *27/16*

U.S. Cl. 408—146 **5 Claims**



1. A boring bar comprising:

a body having two axial ends and adapted to be rotatably driven around a predetermined axis,

said body having a longitudinally extending bore open to at least one end of said body, said bore having an axis which intersects said predetermined axis at an acute angle,

a cutting tool having an elongated shank with a cutting edge at one end, the other end of said shank being longitudinally slidably and removably received in one end of said bore at a first end of said body, and

means insertable into the other end of said bore for both retaining said shank to said body within said bore and for resiliently urging said shank into said one end of said bore,

a nut threadably secured to said first end of said body,

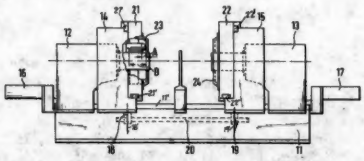
means for locking said shank to said body at an adjustable user selected longitudinal position within said bore comprising

a pin secured to said extending laterally outwardly from said shank, said pin being axially slidably received in a slot formed in said body, said slot being open to said first end of said body, and wherein an axial end of said nut abuts against said pin so that rotation of said nut longitudinally displaces said shank with respect to said body.

4,619,565
MILLING MACHINE, ESPECIALLY CRANKSHAFT MILLING MACHINE

Karlheinz Schmid, Nuertingen-Oberensingen, and Heinrich Bonfert, Dettingen, both of Fed. Rep. of Germany, assignors to Gebrueder Heller, Maschinenfabrik GmbH, Nuertingen, Fed. Rep. of Germany

Filed May 20, 1985, Ser. No. 736,231
Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418583
Int. Cl.[4] B23C *3/06*
U.S. Cl. 409—135 7 Claims



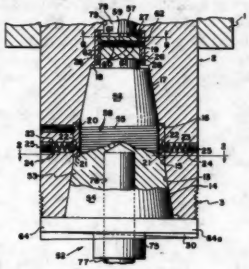
1. A milling machine comprising a left milling unit and a right milling unit with respective milling cutter means supported on a machine bed, and including at least a longitudinal slide on or in each milling unit, drive means for displacing the respective longitudinal slide in a longitudinal direction along said machine bed, clamping means on said machine bed, each milling unit comprising a respective length reading device for reading length values from a length scale secured in a fixed position to said machine, said milling machine comprising a single measuring pick-up means (25) carried by one of said longitudinal slides (14) in a position for measuring spacings relevant to both of said milling units, rest stop means including cooperating members (30, 31) arranged in a position for defining a substantially constant rest position of said measuring pick-up means (25) and measuring stop means including cooperating elements (35, 36) for defining a measuring position of said measuring pick-up means (25), one element (35) being carried by said one longitudinal slide (14), the other element being carried by the respective clamping means, spring means (32, 33) mounting said measuring pick-up means (25) to said one longitudinal slide for urging said stop members (30, 31) into cooperation in the rest position of said one longitudinal slide (14), said measuring pick-up means (25) being responsive to an instruction signal from a machine control unit for measuring a spacing between said milling cutter means (26) and both of said stop means and for providing a respective correction signal component to said machine control unit, said control unit providing a correction value for both milling units from said single measuring pick-up means.

4,619,566
TOOL SUPPORT ASSEMBLY

Donald W. Botimer, 8718 Swaffer Rd., P.O. Box 175, Frankenmuth, Mich. 48734

Filed Mar. 9, 1984, Ser. No. 587,807
Int. Cl.[4] B23B *39/08*
U.S. Cl. 409—232 32 Claims

19. In tool holder apparatus adapted for removable connection to a body member rotatable about an axis, said body member having an axially extending socket provided with an annulus having at least one radially extending slot therein defined by a pair of circumferentially spaced sides, and a tool-supporting coupling member removably accommodated in said socket, said coupling member having a radially extending lug accommodated in said slot with one side of said lug confronting one of said sides of said slot, the improvement comprising circumferentially yieldable shock absorber means carried by at least

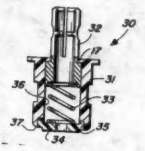


one of said members and interposed solely between said confronting sides.

4,619,567
BIT HOLDER WITH IMPACT RELEASE MECHANISM

James H. Campbell, 1210 W. Alameda, Ste. 108, Tempe, Ariz. 85282

Filed May 11, 1984, Ser. No. 609,303
Int. Cl.[4] B23C *1/00*
U.S. Cl. 409—234 1 Claim



1. A drill bit holder for automatic drilling machines which limits impact stresses comprising:

an elongated hollow cylindircal-shaped housing,

a hollow elongated cylindircally-shaped gripper means for slidably fitting into one end of said housing a predetermined distance with at least a part of it extending axially outwardly of the other end of said housing for gripping a bit,

a coiled spring means for slidably fitting into said one end of said housing for bearing at one end against said gripping means, and

a disc-shaped snap ring comprising a convex shaped peripheral edge for detachably engaging the inside surface of the hollow interior of said one end of said housing and a face having a centered circular depressing for engaging one end of said spring means for holding said spring means in said housing under tension,

said inside surface of the hollow interior or said one end of said housing being provided with an annular groove for receiving in a mating relationship the peripheral edge of said disc-shaped snap ring,

said disc-shaped snap ring being formed of a flexible, resilient self-lubricating material and having an aperture extending axially therethrough with a radial slot extending from said aperture to its peripheral edge.

4,619,568

HEAT RECOVERABLE LOCKING DEVICE

Kenneth J. Carstensen, 4540 N. 44th St., No. 70, Phoenix, Ariz. 85018

Filed Oct. 24, 1983, Ser. No. 544,868
Int. Cl.[4] F16B *39/12*
U.S. Cl. 411—222 1 Claim

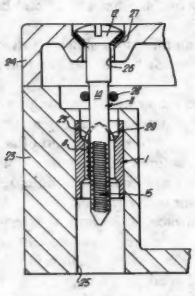
1. In combination, a load-carrying nut including an internal wall defining a through hole in the load-carrying nut, the wall having internal screw threads formed on it, and a lock nut comprising a solid body in the shape of a frusto-conical disc constructed from a memory metal and having a periphery and a pair of oppositely directed faces, one of the faces having a convex shape, the periphery of the lock nut including at least one pair of opposed recesses for receiving a spanner wrench, the lock nut further including a bore having internal screw threads and a diameter that is undersized relative to the hole defined by the wall of the load-carrying nut, the load-carrying nut having a pair of opposed surfaces arranged extending from the hole thereof, one of the surfaces being concave and configured to matingly receive the convex face of the lock nut for reducing the total height dimension of the combination of load-carrying nut and lock nut, and wherein the memory metal possesses a thermoelastic transition between a martensitic state and an austenitic state, the metal being deformable dimensionally while in its martensitic state and capable of recovering to a non-deformed dimension in the austenitic state for reducing the diameter of the bore when the lock nut has recovered to the austenitic state to grippingly engage a stud on which the load-carrying nut and lock nut are threadable.

4,619,569

QUICK-RELEASE FASTENER WITH INTERMITTENT THREADS

Andrew C. W. Wright, Surrey, England, assignor to Dzus Fastener Co. Inc., West Islip, N.Y.

Filed Dec. 21, 1983, Ser. No. 564,242
Claims priority, application United Kingdom, Jan. 11, 1983, 8300669; European Pat. Off., Nov. 2, 1983, 83306667.3
Int. Cl.[4] F16B *21/00*
U.S. Cl. 411—347 11 Claims



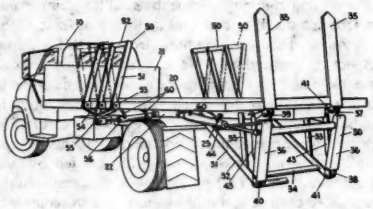
1. A quick-release fastener comprising a threaded stud and a complementarily threaded receptacle, said stud and said receptacle each having at least one longitudinally extending threaded portion and at least one longitudinally extending unthreaded portion, said at least one threaded portion of said stud and said receptacle respectively having a lesser angular width than said at least one unthreaded portion of said receptacle and said stud respectively, said fastener including at least one longitudinal rib which runs along the length of said at least one threaded portion, whereby said stud can be inserted into said receptacle with said threaded and unthreaded portions of said stud and receptacle respectively aligned and can thereafter be rotated to engage said respective threaded portions, said stop preventing over rotation of said stud within said receptacle thereby to define a fastened orientation of said stud within said receptacle.

4,619,570

BALE LOADING-STACKING APPARATUS

Charles Siebenga, 76911 Gallatin Rd., Bozeman, Mont. 59715

Continuation of Ser. No. 363,645, Mar. 30, 1982, abandoned.
This application Apr. 10, 1984, Ser. No. 598,925
Int. Cl.[3] A01D *87/12*; B60P *1/44*
U.S. Cl. 414—39 8 Claims



1. Large bale loading-stacking apparatus for loading and stacking large bales of hay on a truck and then transferring the stacked bales as a unit from the truck to a storage area, all without having to manually handle the large bales, said apparatus comprising:

a large bale accumulator platform mounted on a bed of the truck, said accumulator platform including pivot mounting means for pivotally mounting said platform on the truck bed to permit said platform to be pivoted between a horizontal position and a vertical position, said pivot mounting means being at a location on the accumulator platform such that the rear end of the platform abuts the ground when the bed is pivoted to a vertical position;

power means for pivoting said platform between a horizontal position and a vertical position;

bale loading apparatus mounted at the rear of the platform, said bale loading apparatus including:

a rigid frame mounted on the underside of the platform and extending downwardly therefrom to a distal end positioned near the ground and below the rear end of the platform;

a loading ramp pivotably mounted on the distal end of the frame for vertical pivotal movement with respect to the frame, the loading ramp including a front portion that extends downwardly and outwardly from the distal end of the frame to ground level when the loading ramp is pivoted to a lowered position, the loading ramp including a rear portion that extends outwardly from the front portion at an angle such that the rear portion extends horizontally rearwardly from the front portion and lies flat against the ground when the loading ramp is lowered, the rear portion being shaped to slide under a large bale of hay when the loading ramp is lowered to the ground and the truck is backed up into a large bale of hay, the rigid frame resisting foward forces on the loading ramp and supporting the

loading ramp as it is being forced under the large bales of hay;

at least one one fluid drive cylinder means for pivoting the loading ramp between its lowered position and a raised position, wherein the loading ramp extends generally vertically against the rear end of the accumulator platform to lift large bales of hay from the ground to the rear of the accumulator platform, said drive cylinder means having an extendable output shaft and being connected at one end to the accumulator platform or frame and connected at the other end to the pivotable loading ramp at a position rearwardly of the loading ramp pivot point, said drive cylinder pivoting the loading ramp upwardly from its lowered to its raised position by retracting the output shaft.

4,619,571

INSTALLATION FOR THE DISTRIBUTION OF SHEETS

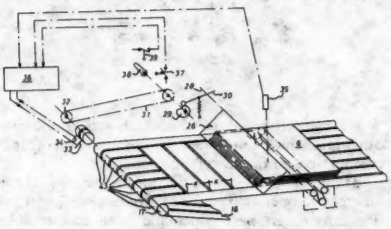
Joseph Peiffer, Iden-Pier, Fed. Rep. of Germany, assignor to O. Dorries GmbH, Duren, Fed. Rep. of Germany

Filed Apr. 8, 1982, Ser. No. 366,530

Claims priority, application Fed. Rep. of Germany, Apr. 22, 1981, 3115925

Int. Cl.⁴ B65H *5/24*

U.S. Cl. 414—130 **2 Claims**



1. In an installation for laying down sheets, particularly sheets of paper, cardboard, or corrugated cardboard, including means for forming small piles of the sheets which are finally laid down in a large pile in a final laying down station, and means for turning a specific number of the small piles front-to-back after a predetermined number of sheets form a small pile, an apparatus for converting the small piles into a line of staggered overlapping sheets that is supplied to the final station, comprising:

conveyor means between said turning means and final laying down station for pulling away each bottom sheet in turn from the snall pile being converted,

means disposed above said conveyor means for spacing adjacent pulled away sheets of the small piles a predetermined distance apart,

said conveyor means including front and rear guide rollers and a conveyor belt disposed therearound,

a first deflection roller being disposed between said front and rear guide rollers,

a second deflection roller having at least a portion thereof disposed between said first deflection roller and said front guide roller, said second deflection roller being disposed downwardly relative to said first deflection roller,

a third deflection roller having at least a portion thereof disposed between said second deflection roller and said front quide roller,

said first deflection roller having a top surface portion thereof extending upwardly a certain distance beyond a plant disposed on respective top surface portions of said rear guide roller and said third deflection roller,

said deflection rollers being located inside a longitudinally adjustable carriage so as to be adaptable to sheets of varying length,

said conveyor belt having a top portion thereof disposed over at least a top surface portion of said first deflection roller and over at least a bottom surface portion of said second deflection roller and over at least a top portion of said third deflection roller, whereby a top portion of said conveyor belt is formed as a loop that moves downwardly out of the feeding plane of said conveyor belt and then returns upwardly into the feeding plane of said conveyor belt, thereby forming a slot between said first and third deflection rollers that is bridgeable by a sheet,

said spacing means includes a backup rail disposed in the feed direction a predetermined distance from said loop of said conveyor belt, and said backup rail having a bottom edge wherein said bottom edge and said conveyor belt define therebetween an outlet slot, said backup rail being movable during operation of the installation under the action of a cam disc so that said outlet slot is adjustable during the operation of the installation from a base position in which the outlet slot is closed so as to be less than the thickness of one sheet, the maximum opening of the slot is controllable by an adjustable time relay, said cam disc is operated by a drive device operatively connected to the drive of said conveyor belt and engageable therewith by a clutch, said drive device for said cam disc has an adjustable transmission ratio.

4,619,572

TRANSFER DEVICE WITH A DOUBLE TIGHT BARRIER BETWEEN A CONTAINER AND A CONFINEMENT ENCLOSURE

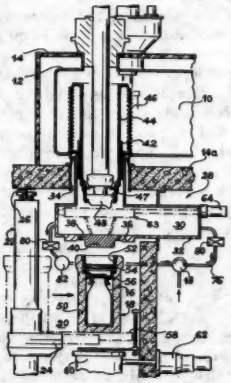
Robert Lorenzelli, Saint-Remy-les-Chevreuses; Pierre Dabernard, Gif sur Yvette, and Christian Maire, Bures-sur-Yvette, all of France, assignors to Cogema, Compagnie Generale des Matieres Nucleaires, Velizy-Villacoublay, France

Filed Nov. 21, 1985, Ser. No. 799,929

Claims priority, application France, Nov. 26, 1984, 84 17966

Int. Cl.⁴ B65B *1/04*

U.S. Cl. 414—217 **7 Claims**



1. A transfer device with a double tight barrier between a container and a confinement enclosure, wherein it comprises a transfer chamber having a first opening issuing into the confinement enclosure and a second opening issuing out of said enclosure, the first and second openings normally being closed by first and second doors respectively; said container having an opening closed by an external door and by an internal door and which can be tightly engaged on the second opening of the chamber in order to link the latter with the container, following the removal of a first double door constituted by the external door of the container and by the second door of the chamber; and a movable wall common to the chamber and to the confinement enclosure, carrying the first opening of the cham-

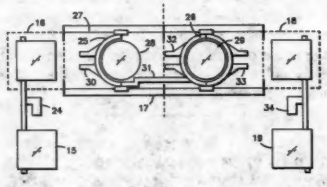
ber and whose displacement makes it possible to engage the latter tightly on the container opening, after removing the first double door, in order to link the container with the confinement enclosure after removing a second double door constituted by the inner door of the container and by the second door of the chamber.

4,619,573

ARTICLE TRANSPORT APPARATUS

Thomas M. Rathmann, Rohnert Park; Herbert G. Drake, San Rafael; Ninko T. Mirkovich, Novato, and Roger B. Lachenbruch, Petaluma, all of Calif., assignors to Tegal Corporation, Novato, Calif.

Filed Mar. 9, 1984, Ser. No. 588,030
Int. Cl.[4] B65G *25/00*
U.S. Cl. 414—222 **5 Claims**



1. Apparatus for transporting a semiconductor wafer from a vertically indexed wafer cassette to a vertically movable chuck assembly, said chuck assembly having a plurality of lift pins extending vertically therefrom, comprising:

rail means extending between said wafer cassette and said chuck assembly in an approximately horizontal and linear path;

shuttle plate means, coupled to said rail means, having an arcuate portion and at least one pair of tines for a semiconductor wafer;

said tines being connected to the convex side of said arcuate portion and extending in a direction parallel to said rail means;

drive means inside said rail means for causing recipro motion of said shuttle plate means, said drive means being magnetically coupled to said shuttle plate means; and

wherein said lift pins can move through the plane of said tines when said shuttle plate is in one position and wherein said arcuate portion is larger than at least some portion of said chuck assembly so that said chuck assembly can pass through the plane of said arcuate portion when the shuttle plate means is in another position.

4,619,574

LOADING EQUIPMENT FOR MANIPULATING TUBES IN UPSETTING PRESSES

Horst Endter, Langenfeld, and Herbert Suther, Dusseldorf, both of Fed. Rep. of Germany, assignors to SMS Hasenclever Maschinenfabrik GmbH, Dusseldorf, Fed. Rep. of Germany

Filed Oct. 31, 1983, Ser. No. 546,910
Claims priority, application Fed. Rep. of Germany, Nov. 4, 1982, 3240689
Int. Cl.[4] B66F *9/00*
U.S. Cl. 414—226 **13 Claims**

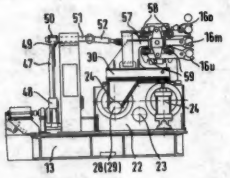
2. In a tube-upsetting plant comprising a vertically divided upsetting die provided with a plurality n of vertically spaced shaping faces, feeding means for moving successive tubes longitudinally into and out of the die and vertically, transversely to the tube axes, into alignment with successive shaping faces, which feeding means comprise:

(a) a plurality of sets of tube tansport grippers which sets are spaced longitudinally of the tubes and in which each set comprises a plurality (n+1) of the tube grippers spaced axially of the die and vertically at a spacing equal to the vertical spacing of the shaping faces of the die;

(b) first drive means for moving said sets of grippers unidirectionally along a closed path transverse to the axes of the tubes, said drive means providing an upper dwell position and a lower dwell position along said path and vertically spaced at a spacing equal to that of said shaping faces, a first one of said dwell positions being so disposed that in said position a first extreme one of said grippers if axially aligned with a first extreme one of said shaping faces of the die;

(c) second drive means for moving the uppermost and lowest grippers in opposite direction to one another towards and away from the die perpendicularly to the said path over a distance greater than the axial length of the die for inserting tubes into and withdrawing tubes from the extreme shaping faces of the die respectively;

(d) and operating means for opening said extreme one of said grippers on movement thereof from said first dwell position to the other said dwell position and for closing said other grippers on movement thereof from said other dwell position to said first dwell position;



(e) the said first and second drive means being synchronised whereby in operation in the said other dwell position the first extreme gripper is open and in an axial position retracted from the die for receiving a tube to be upset and the other extreme one of the grippers is open and in an axial position advanced towards and axially aligned with the other extreme one of the shaping faces of the die for gripping an upset tube to be withdrawn, and in the said first dwell position the first extreme gripper is in an axial position advanced towards and axially aligned with the said first extreme shaping face of the die for locating therein the tube to be upset and the other extreme gripper is axially withdrawn from the die, whereas the gripper(s) intermediate between the said extreme grippers are operative to transfer tubes successively from each said shaping face to the next following shaping face.

4,619,575

APPARATUS FOR STORAGE AND RETRIEVAL OF THIN TRAYS AND SHEETS

Gareth D. Summa, Riverside, Mo.; George K. Reed, and Harold S. Burt, both of Kansas City, Kans., assignors to Mid-West Conveyor Company, Inc., Kansas City, Kans.

Filed Jan. 28, 1985, Ser. No. 695,579
Int. Cl.[4] B65G *1/06*
U.S. Cl. 414—280 **15 Claims**

1. An apparatus for selectively storing a thin tray in an elongate storage location, and retrieving said tray therefrom; said tray being generally rectangular in configuration and having substantially parallel front and rear edges, and having substantially parallel side edges; said apparatus comprising:

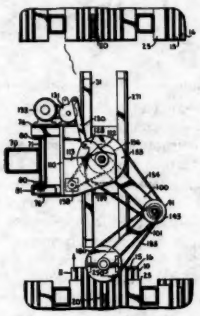
(a) a tray extractor having a tray engagement mechanism, a tray linear-movement actuator, and an orientation adjustment mechanism;

(i) said tray engagement mechanism being mounted on said linear-movement actuator and comprising a generally X-shaped scissors mechanism having two pairs of substantially simultaneously actuated opposing jaw

members mounted thereon for selective engagement with a selected tray during actuation of said scissors mechanism; said scissors mechanism having a first side and a second side and being oriented for selective engagement of said tray engagement mechanism with a tray substantially adjacent either of said scissors mechanism first side or said scissors mechanism second side;

(ii) said linear-movement actuator comprising a linear motion link and pulley arrangement including first and second links; said second link having a tray engagement mechanism mounting point thereon which exhibits linear movement, during operation of said linear-movement actuator, along a linear path of storage and retrieval centered on a line substantially parallel to and coplanar with said tray side edges and generally centered therebetween;

(iii) said scissors mechanism being rotatably mounted on said mounting point, rotation of said scissors mechanism



being selectively controlled by said orientation adjustment mechanism to maintain a tray, being acted upon by said extractor, in an orientation for storage and retrieval;

(b) a tray support mechanism including a pair of support rails and lift means;

(i) said rails being generally parallel to said linear path of storage and retrieval, and being spaced apart to support a tray substantially along the side edges thereof;

(ii) said lift means selectively lifting said rails to support a tray, or lowering out of immediate proximity of a tray, as selected, during operation of said assembly; and

(c) a transport assembly having said extractor and said tray support mechanism mounted thereon; said transport assembly including transport means for selectively positioning said extractor in an operational position with respect to a selected storage location;

(d) whereby a selected tray may be stored within a selected storage location, or removed therefrom.

4,619,576

FEED SYSTEM FOR TOBACCO BLENDING/BULKING BINS

Kurudamannil A. George, Levittown, and Peter E. Zagorzycki, Lansdale, both of Pa., assignors to Proctor & Schwartz Inc., Horsham, Pa.

Filed Aug. 28, 1985, Ser. No. 770,319
Int. Cl.[4] B65G *15/22*
U.S. Cl. 414—300 **7 Claims**

1. A blending and bulking bin assembly comprising

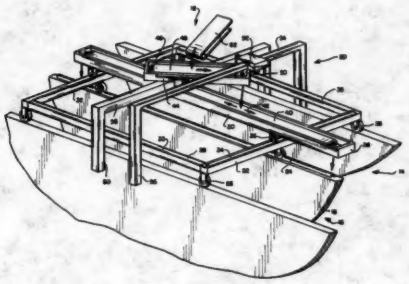
(a) an elongated, rectangular bin having longitudinal X and lateral Y directions;

(b) a trolley movable longitudinally with respect to the bin;

(c) a shuttle conveyor carried by said trolley and moveable laterally on the trolley with respect to the bin;

(d) an endless conveyor belt carried by said shuttle conveyor;

(e) a feed conveyor adapted to feed tobacco onto said shuttle conveyor belt, said feed conveyor having a movable discharge end;



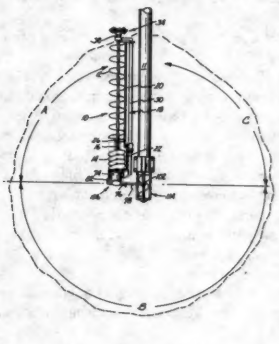
(f) drive means mechanically independent from the shuttle X direction of movement affixed to said feed conveyor discharge end to move said discharge end laterally to coincide with lateral movement of the shuttle conveyor.

4,619,577

SWEEP AUGER

Lynos Swanson, R.R. #1, Lawton, N. Dak. 58345

Filed Nov. 20, 1984, Ser. No. 673,280
Int. Cl.[4] B65G *65/46*
U.S. Cl. 414—312 **11 Claims**



1. An elongated sweep auger attachment for use in combination with unloading conveyor means comprising:

auger means including at least one auger section;

backboard means extending along one side of the auger means;

drive means supported by the backboard means and operatively connected to the auger means;

bracket means carried by the backboard means for rotatably supporting a first end of the auger means;

support means carried by the backboard means, supporting a second end of the auger means; and

means for selectively pivotally mounting the sweep auger attachment on the unloading conveyor means about a pivot axis in a first and a second position, the sweep auger having a longitudinal plane which is parallel to the pivot axis and contains the longitudinal axis of at least one auger section, the pivot axis being offset with respect to the

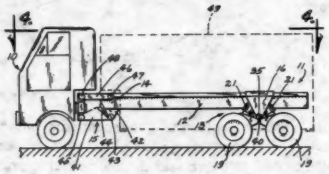
longitudinal plane in the first position and lying substantially in such plane in the second position.

4,619,578

RETRACTABLE WHEEL SUSPENSION APPARATUS

James H. Routledge, 2904 SW. BlueGrass Way, West Linn, Oreg. 97068

Filed Apr. 19, 1985, Ser. No. 724,878
Int. Cl.[4] B60P 1/02
U.S. Cl. 414—498 3 Claims



1. A self loading retractable two wheel suspension apparatus for a trailer attached to a vehicle via an articulated linkage; wherein the trailer comprises a generally U-shaped frame having an open center and end, and a closed front and sides; and, wherein said suspension apparatus comprises:

a downwardly depending suspension bracket operatively secured to each side of said frame and having a pair of inclined plates formed intermediate the ends of the suspension bracket;

a pivot pin operatively secured to one end of said suspension bracket;

a first and second suspension arm operatively and independently secured to said suspension bracket and mounted on one end to said pivot pin for relative movement with respect to one another said pin being in a plane bi-secting the angle between said inclined plates on said suspension bracket with an extension of said plane forming a stop for the arms, wherein each suspension arm comprises:

attaching means for operatively pivotally attaching one end of the suspension arms to said frame along a first horizontal axis on said pin;

a wheel assembly;

means for rotatably attaching said wheel assembly to the other end of the suspension arms along a second horizontal axis;

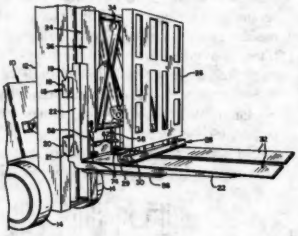
retracting means for selectively operably pivoting said arm means about said first horizontal axis between a first position wherein said second horizontal axis is below and to the side of said first horizontal axis and a second position wherein said second horizontal axis is to the side and above said first horizontal axis; wherein said retracting means are operably attached at one end thereof to respective ones of said inclined plates on said suspension bracket and operably attached at the other end thereof to an intermediate portion of the suspension arms, for the purpose of providing independent suspensions for said wheel assemblies when the terrain beneath one of said wheel assemblies is higher than the terrain below the other wheel asembly, whereby the retracting means are provided to actuate the articulated linkage intermediate the vehicle and trailer frame as a consequence of the raising and lowering of the trailer frame to effect the loading and unloading of said trailer frame.

4,619,579

FREE STANDING LIFT TRUCK ATTACHMENT WITH QUICK CONNECTION

Emmett Frison, Portland, Oreg., assignor to Brudi Equipment Co., Longview, Wash.

Filed Jul. 13, 1984, Ser. No. 630,773
Int. Cl.[4] B66F 9/14
U.S. Cl. 414—607 12 Claims



1. A load-handling attachment for the front end of a forklift truck having a mast and a load carriage movable along the mast, the attachment comprising:

an upright base frame including connecting means for connecting said attachment to the load carriage, and means for disengaging said connecting means from said carriage to enable detachment of the attachment from the lift truck;

base frame support means for supporting said base frame in an upright free-standing position over an underlying support surface while detached from a lift truck; and

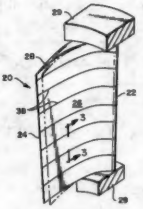
support mounting means for mounting said support means to said base frame for linear sliding movement between a lowered base frame supporting ground-engaging position and a raised retracted position and for locking the support means in said positions, said support means including a ground-engaging portion extending rearward to at least the upright rear face of the base frame in said ground-engaging position to provide ground support rearward of said mounting means and thereby resist rearward tipping of the base frame when free standing.

4,619,580

VARIABLE CAMBER VANE AND METHOD THEREFOR

Howard E. Snyder, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 8, 1983, Ser. No. 530,985
Int. Cl.[4] F01D 17/08, 17/16
U.S. Cl. 415—12 4 Claims



1. A variable camber vane having a first portion adapted to be secured to a mounting means, a second free tip portion spaced from said first secured portion, and a working face disposed within and diverting flow of a working fluid, for temperature-responsive deflection of said tip portion as respects said root coorelative to the temperature of said working fluid,

said vane comprising:

a. a sintered, generally laminar composite of a first amorphous metallic composition as a first vane element;

b. a second amorphous metallic composition as a second vane element;

c. said vane elements being characterized in that the coefficients of thermal expansion for each of said first and second compositions differ in a manner that the camber of said vane varies in response to thermal variations of said working fluid;

d. each of said amorphous metallic compositions being an RSR amorphous metallic composition;

e. each of said first and second vane elements being formed with an array of lateral surface grooves disposed generally along a flow path of said working fluid.

4,619,581

SAFETY FUEL DEGRADING

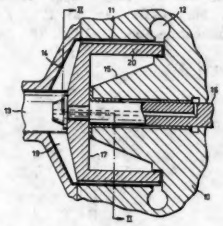
Geoffrey A. Lewis, Solihull; Ernest A. Timby, Frimley, and Rodney H. Walsh, Hindhead, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 438,722, Nov. 3, 1982, abandoned. This application Jul. 9, 1985, Ser. No. 753,357

Claims priority, application United Kingdom, Nov. 10, 1981, 8133894

Int. Cl.[4] F02C *3/20*

U.S. Cl. 415—143 **3 Claims**



1. A single combined device for concurrently pumping and degrading an anti-mist component in a safety fuel, said device comprising:

a housing having a generally cylindrical bore, an inlet and an outlet communicating with respective ends of said bore, and

a rotor mounted for rotational movement in said bore within said housing, said rotor including (a) centrifugal pump means having plural radially extending vanes arranged substantially perpendicular to said inlet for low pressure pumping of the safety fuel from said inlet towards said bore and (b) a generally cylindrical fuel-degrading portion arranged substantially perpendicular to and downstream of said centrifugal pump means, said fuel-degrading portion having a periphery disposed closely adjacent the radially innermost surface of the wall of said bore,

said cylindrical fuel-degrading portion and said bore each including means for defining continuous substantially parallel opposing sets of relatively small sized grooves extending along the length of said bore and said periphery of said cylindrical fuel-degrading portion from said integral centrifugal pump means to said outlet to thereby establish a narrow fuel-degrading path, wherein said centrifugal pump means, upon rotational movement of said rotor, urges fuel to flow through said grooves to said outlet, and wherein said groove-defining means degrades the fuel flowing therethrough by virtue of relative movement between said opposing sets of grooves as the fuel flows along said fuel-degrading path so that said anti-mist component in said safety fuel is degraded upon reaching said outlet.

2. A method of simultaneously pumping and degrading a safety fuel of the type having an anti-mist component therein, said method comprising the steps of:

(1) raising the fuel to a predetermined pressure in a centralized pump element integrally included in a cylindrical rotor mounted for rotational movement within a bore defined in a housing;

(2) passing the thus pressurized fuel through a degrading device also integrally included in said cylindrical rotor within said housing, the periphery of said rotor lying closely adjacent an innermost surface of said bore, said rotor periphery and said surface having axially extending grooves of relatively small size; and

(3) alternately transferring the pressurized fuel, by rotating said rotor, between the small grooves defined in the rotor and the small grooves defined in the innermost surface of the housing, thereby degrading the anti-mist component, the product of the length of said small grooves, their number and the angular velocity of said rotor being such that each part of the fuel is transferred between the small grooves in the rotor and the housing by a number of times which is at least equal to the value 4150N/cm^2 divided by said predetermined pressure.

4,619,582

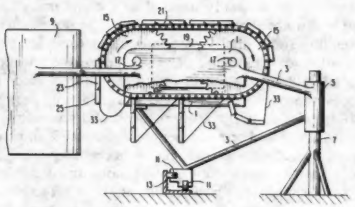
APPARATUS FOR RECOVERING THE ENERGY OF A MOVING FLUID

David M. Slonim, P.O. Box 1869, 3, Ourani Str., Nicosia, Cyprus

Filed Oct. 22, 1985, Ser. No. 790,961

Int. Cl.[4] F03D *5/02*

U.S. Cl. 416—8 **7 Claims**

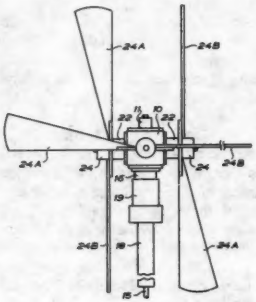


1. Apparatus for recovering energy from a moving fluid comprising a frame, means mounting the frame for horizontal swinging movement about a fixed vertical axis under the influence of the fluid, an endless series of flaps, means mounting said endless series of flaps for circulating movement on the frame in an endless path having horizontal upper and lower runs, means mounting said flaps for vertical swinging movement whereby said flaps depend from said lower run and lie flat along said upper run, a plurality of said flaps depending from said lower run being disposed in spaced parallel vertical planes, said flaps each comprising a plurality of horizontally elongated rigid frames pivotally interconnected about horizontal axes, louver slats disposed within each said rigid frame and extending transverse to the length of the rigid frame for permitting fluid to pass through the rigid frame while at the same time exerting pressure against the louver slats, there being a plurality of said louver slats on each side of the longitudinal center of each said horizontally elongated rigid frame, all the slats on one side of said center being inclined in one direction and all the slats on the other side of said center being inclined in an opposite direction to urge the fluid that passes through the slats toward a central portion of the next flap in a downstream or downwind direction, and means for converting the kinetic energy of said moving flaps into another form of energy.

4,619,583
WIND TURBINE

Bengt R. Wikstrom, Elinebergs Plats 8, S-252 58, Helsingborg, Sweden

Filed Feb. 10, 1984, Ser. No. 578,799
Claims priority, application Sweden, Dec. 9, 1983, 8306803
Int. Cl.[4] F03D 3/02
U.S. Cl. 416—122 4 Claims



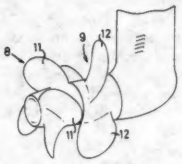
1. A wind turbine, comprising a first pair of rotors equipped with wings, rotor shafts mounting said first pair of rotors, said shafts each having a longitudinal axis with one wing lying in a plane extending substantially parallel to a plane passing through said longitudinal axis and with the other wing lying in a plane extending substantially perpendicular to said longitudinal axis, a second pair of rotors, equipped with wings, rotor shafts mounting said second pair of rotors, said rotor shafts having each a longitudinal axis with one wing lying in a plane extending substantially parallel to a plane extending through said longitudinal axis and with the other wing lying in a plane extending substantially perpendicular to said longitudinal axis of said rotor shaft, one of said first pair of rotors being displaced 180° in relation to the other rotor of said first pair of rotors and one of said second pair of rotors being displaced 180° in relation to the other rotor of said second pair of rotors, the rotors of said one pair being displaced 90° in relation to the rotors of said second pair, gear wheels being provided on said rotor shafts, an oil-proof gearing housing rotatably mounting said rotor shafts, the gear wheels on the other shafts of said first pair of rotors engaging the gear wheels on the rotor shafts of said second pair of rotors to form therewith a gear train providing a ratio of 1:1 between said first and second pairs of rotors and interconnecting said shafts for position-synchronized rotation of the rotors, a vertical output shaft fixedly connected at its upper end to the top of said gearing housing and extending through the interior thereof, said rotor shafts extending generally transverse to said output shaft on diametrically opposite sides of the output shaft, a stationary element pivotally supporting said gearing housing at the bottom thereof for rotation about the axis of said output shaft, and a gear ring on said element, enclosed by the gearing housing and positioned coaxially relative to said output shaft, the gear wheels on the rotor shafts of said second pair of rotors engaging said gear ring.

4,619,584
DOUBLE PROPELLER DRIVE FOR BOATS

Lennart Brandt, Fjärås, Sweden, assignor to AB Volvo Penta, Gothenburg, Sweden

Continuation of Ser. No. 354,769, Mar. 4, 1982, abandoned. This application Feb. 2, 1984, Ser. No. 576,150
Claims priority, application Sweden, Mar. 5, 1981, 8101423
Int. Cl.[4] B63H 5/10
U.S. Cl. 416—129 17 Claims

1. In a steerable double propeller outboard drive unit for a boat having a transom and means mounting said unit on said transom for steering said unit about a generally upright steering axis, said unit including a first propeller having a plurality of blades, a first propeller shaft drivingly connected to said first propeller, and a second propeller having a plurality of blades, a second propeller shaft mounted concentrically with said first shaft and drivingly connected to said second propeller, power means including a substantially vertical output drive shaft

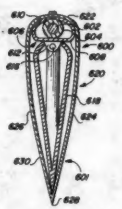


coupled to said first and second shafts for rotation of said first and second propellers in opposite directions, the improvement comprising the after propeller of said first and second propellers being of a predetermined diameter smaller than the diameter of the fore propeller, and said after propeller including at least one blade more than said fore propeller so that said first and second propellers provide approximately equal thrust to minimize the reaction steering moments on said unit.

4,619,585
WIND TURBINE APPARATUS

Joe Storm, 1105 W. Elna Rae, Tempe, Ariz. 85281

Division of Ser. No. 518,047, Jul. 28, 1983, Pat. No. 4,545,729. This application Sep. 23, 1985, Ser. No. 779,271
Int. Cl.[4] F03D 3/06
U.S. Cl. 416—132 B 13 Claims



1. Air foil sail element apparatus, comprising, in combination:

support rod means; and

air foil means journaled for rotation on the support rod means, including

a pivot rod spaced apart from the support rod means for controlling the pivoting of the air foil means,

an interior form secured to the pivot rod, and

a deformable outer skin secured to and disposed about the interior form and deformable against the interior form to change the camber of the air foil in response to wind.

4,619,586
EXTERNALLY CONTROLLED VARIABLE PITCH FAN HUB ASSEMBLY

William C. Carter, Lenexa, Kans., assignor to The Marley Cooling Tower Company, Mission Woods, Kans.

Filed Jul. 19, 1984, Ser. No. 633,099
Int. Cl.[4] F04D 29/36; B64C 11/38
U.S. Cl. 416—157 R 13 Claims

1. Variable pitch fan blade and hub assembly adapted to be mounted on a power driven shaft comprising:

a rotatable housing having a central coupling configured to

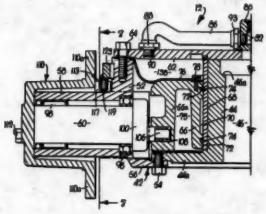
be secured to the driven shaft and provided with a length extending axially of the shaft when the assembly is mounted thereon, said housing further being provided with a plurality of radially-extending bores;

a fan blade for each housing bore;

an axle section connected to each blade and rotatably received in a corresponding housing bore;

transmission means within the housing and operably coupled to said axle sections for imparting a rotational moment to each axle section such that the pitch of the blades is varied, said transmission means includes cam follower means extending from the inner end of each of said axle sections, said cam follower means being disposed eccentrically relative to said inner end of each of said axle sections;

hub means including a hub member disposed coaxially within said housing, said hub member being complementally telescoped over said coupling and selectively movable longitudinally thereon relative to the rotational axis of said housing, said hub means being provided with circumferentially-extending cam track means, said cam track means cooperating with said cam follower means such that when said hub means moves longitudinally relative to the rotational axis of said housing, said cam follower means follows said cam track means so that a rotational moment is imparted to said axle section due to said eccentric disposition of said cam follower means relative to said inner end of said axle section for simultaneously varying the pitch of the blades; and



a plurality of springs within said housing and engaging said hub means outboard of said hub member for biasing said hub means longitudinally relative to the axis of rotation of said housing, said springs being spaced circumferentially around said hub means and being positioned within the housing outboard of said cam track means.

4,619,587

COMPRESSOR DRIVE FOR AUTOMOBILE AIR CONDITIONING COMPRESSOR HAVING V-BELT VARIABLE DRIVE

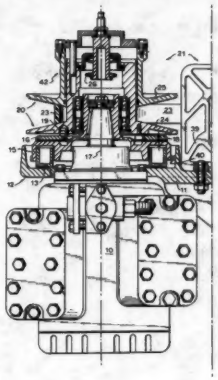
Karl-Heinz Linnig, Dornierstrasse 33, D-7990 Friedrichshafen, Fed. Rep. of Germany

Filed Feb. 22, 1984, Ser. No. 583,243

Int. Cl.[4] F04B *9/00*

U.S. Cl. 417—319 **3 Claims**

1. In a compressor drive for air conditioning compressors of motor vehicles having a combustion motor for driving a compressor having a drive shaft, wherein a drive of the compressor is performed by means of a controllable V-belt variable gear connected to the compressor and wherein an air conditioning capacity of the compressor is independent from a rotational speed of said combustion motor, the improvement comprising said variable gear including an output belt disk (**20**); an electromagnetic clutch (**12**) including a rotor (**15**) immediately and rigidly connected to the drive shaft of the compressor and an anchor ring (**16**) connected to said output belt disk whereby said variable gear with said compressor and said electromagnetic clutch, interconnected between said variable gear and said compressor, form a single structural unit, said variable gear further including a drive belt disk (**22**) operatively connected to said combustion motor and connected to said output belt disk by a belt; and a U-shaped support (**39**) and a supporting frame, said drive belt disk being supported in said support



which is connected to said frame, said frame receiving the compressor.

4,619,588

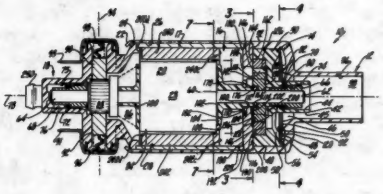
WET MOTOR GEROTOR FUEL PUMP WITH VAPOR VENT VALVE AND IMPROVED FLOW THROUGH THE ARMATURE

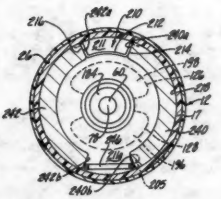
Harry W. Moore, III, Watkins Glen, N.Y., assignor to Facet Enterprises, Incorporated, Tulsa, Okla.

Filed Apr. 25, 1984, Ser. No. 603,599

Int. Cl.[4] F04C *15/02, 2/10;* **H02K** *21/06;* **F16D** *1/08*

U.S. Cl. 417—366 **19 Claims**





1. A wet motor gerotor pump for pumping a liquid of low electrical conductivity from a liquid source, said pump comprising:

a pump case having one end, an opposite end and a flow axis therethrough, said pump case further comprising an inlet end bore at said one end adapted to communicate with said liquid source and means for sealing said pump case;

an inlet chamber adjacent sid inlet end bore;

a motor chamber located in said opposite end of said pump case;

a pump chamber interposed said motor chamber and said inlet chamber;

inlet housing means mounted in said pump chamber, said inlet housing means comprising an annular hub protruding into said inlet chamber, said inlet housing means further comprising a gerotor cavity having a gerotor outlet port, said gerotor cavity disposed about a gerotor axis located parallel to and displaced a predetermined distance in an eccentric radial direction from said flow axis;

outlet housing means having pump outlet means adapted to communicate liquid from said pump and further comprising a second means for sealing coupled to said means for sealing said pump case to said outlet housing means, said outlet housing means further comprising vapor vent means;

gerotor pump means located in said gerotor cavity, said gerotor pump means comprising an inner pump gear, an outer pump gear, and means for driving said inner and outer pump gears, said gerotor pump means further comprising a locating hole spaced from said gerotor axis; and

electric motor means comprising armature means comprising an armature shaft with a first and a second end rotatably supported, respectively, at said inlet housing means and said outlet housing means, said armature means further comprising drive hub means having an axially extending portion, said electric motor means further comprising means for separating said liquid from said armature means as said liquid flows from said gerotor cavity to said outlet housing means, said means for separating further comprising keeper means defining a first axial flow passage between said gerotor cavity and said outlet housing means substantially along said flow axis, said keeper means comprising first and second spaced apart protrusions extending axially, said first and second spaced apart protrusions defining a fluid entrance therebetween, one of said first and second spaced apart protrusions abutting said pump chamber, the other of said first and second spaced apart protrusions having an end with a first step and a second step, one of said first step and said second step abutting against said pump chamber, the other of said first and said second step extending into said locating hole in said gerotor pump means, such that said keeper means establishes said first axial flow passage past said armature means substantially free of turbulence and flow restrictions to thereby allow liquid to be pumped at substantially higher flow rates at armature currents substantially lower than without said means for separating, whereby said first axial flow passage allows liquid to be pumped about said armature means and to thereby improve pumping efficiency;

whereby said gerotor pump means pumps liquid from said source through said inlet chamber, past said gerotor cavity through said gerotor outlet port into said motor chamber, then along said means for separating said liquid from said armature means into said outlet housing means, said vapor vent means permitting vapor to vent from said gerotor pump means for a predetermined period, said vapor vent means further terminating the venting of vapor upon the pumped liquid being communicated to said vapor vent means.

4,619,589

DIAPHRAGM PUMP, PARTICULARLY FOR DOSING LIQUIDS

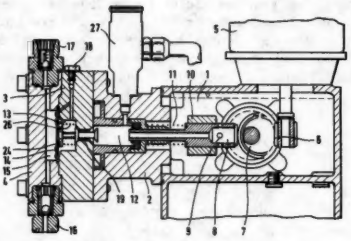
Klaus Müller, Karlsruhe, and Sieghard Oberacker, Dettenheim, both of Fed. Rep. of Germany, assignors to Alldos Eichler KG, Pfinztal, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,618

Claims priority, application Fed. Rep. of Germany, Aug. 21, 1984, 3430721

Int. Cl.[4] F04B *43/06*

U.S. Cl. 417—388 **10 Claims**



1. A diaphragm pump, particularly for dosing liquid, comprising a diaphragm arranged in a housing, a dosing chamber with a suction and a pressure valve on one side of the diaphragm, a hydraulic working chamber with a drive piston and a pressure relief valve on the other side of the diaphragm, a chamber arranged between the diaphragm and hydraulic working chamber, at least one overflow channel connecting the chamber with the hydraulic working chamber, a valve unit including a tappet with a valve disk at each end thereof facing openings of the at least one overflow channel into the chamber and hydraulic working chamber and movable alternately to close with one valve disk the opening into the chamber and with the other valve disk the opening into the hydraulic working chamber, and the valve unit being operatively connected with the diaphragm by means of a support disk and a light loading spring which urges the support disk into loose engagement with the diaphragm.

4,619,590

AIR DIVERTER FOR SUPERCHARGER

Kenneth A. Johnson, 15236 Tacoma St., Detroit, Mich. 48205

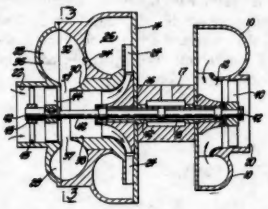
Filed Apr. 22, 1985, Ser. No. 725,956

Int. Cl.[4] F04B *17/00, 35/00*

U.S. Cl. 417—407 **3 Claims**

1. An engine supercharger comprising a turbine housing, a main turbine wheel of the radial-inflow type located within said turbine housing, a compressor housing having an air entrance passageway (**38**), a compressor wheel of the centrifugal type located within said compressor housing, a main shaft (**18**) of annular construction interconnecting said turbine wheel and said compressor wheel whereby the two wheels rotate as a unit, an auxiliary turbine wheel of the axial flow type located downstream from the main turbine wheel, a fan of the axial flow type located upstream from the compressor wheel, an auxiliary shaft (**42**) extending within the main shaft between the auxiliary turbine and fan whereby the auxiliary turbine and fan rotate as a unit, and an annular air collector chamber means (**28**) located immediately downstream from the fan in surrounding relation to the aforementioned entrance passageway for diverting some of the fan air from the compressor wheel, said fan comprising a hub and blades radiating outwardly therefrom, said air collector chamber being defined in part by

an annular wall (30) having a free edge located within the fan blade axial profile whereby said annular wall intercepts air



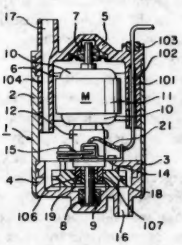
discharged from outer tip areas of the fan blades to divert same away from the compressor wheel into the collector chamber.

4,619,591

IN-TANK TYPE FUEL PUMP

Shingo Iwai; Ryozo Suzuki; Jun Shiraga, and Tetsuo Okashiro, all of Fukuyama, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 6, 1985, Ser. No. 795,403
Int. Cl.[4] F04B *17/00;* H02K *5/02, 5/04*
U.S. Cl. 417—422 8 Claims



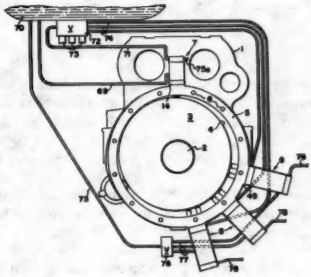
1. In-tank type fuel pump comprising a pump body having a cylindrical yoke with its one end closed by a cover-out member made of a synthetic resinous material, a motor held in said pump body and an impeller driven by said motor to discharge fuel sucked from an intake port to a discharge port, characterized in that an elongated portion extending along the inner wall of said cylindrical yoke is formed integrally with said cover-out member and each of first lead wires is extended from the interior of said pump body to the exterior of the same through each through hole formed in said elongated portion, each one end of said first lead wires in said pump body being connected to each of second lead wires connected to brushes.

4,619,592

PUMPING SYSTEM HAVING A MAIN PUMP AND A PLURALITY OF SELECTIVELY OPERABLE SUBSIDIARY PUMPS

Fredrick L. Bender, 4825 Holland Rd., Saginaw, Mich. 48601

Filed Mar. 5, 1984, Ser. No. 586,414
Int. Cl.[4] F04B *23/04*
U.S. Cl. 417—429 12 Claims



1. A pressure fluid pumping system comprising a main fluid pump having a fluid inlet and a fluid outlet and at least one subsidiary fluid pump having a fluid inlet and a fluid outlet; means coupling the fluid inlet of said main pump to a source of fluid; means coupling the fluid outlet of said main pump to a fluid circuit incorporating said subsidiary pump; valve means in said circuit for selectively diverting fluid from said subsidiary pump or delivering fluid thereto; means independent of said fluid inlet and said fluid outlet of said main pump and coupling said subsidiary pump to a source of hydraulic fluid; driving means for driving said main pump and said subsidiary pump; actuator means carried by said subsidiary pump and engageable with said driving means to effect operation of said subsidiary pump; and means mounting said actuator means for movements out of and into engagement with said driving means in response to the diversion from or delivery thereto of fluid from said main pump.

5. A fluid pump comprising a housing having therein a relatively high pressure compartment and a relatively low pressure compartment; a fluid chamber between said compartments having fluid inlet means in communication with said low pressure compartment and fluid outlet means in communication with said high pressure compartment; reciprocable piston means operable in response to movement in one direction to deliver fluid from said chamber to said high pressure compartment; and force transmitting means for effecting reciprocation of said piston means, said force transmitting means comprising a hollow, reciprocable plunger within said low pressure compartment on which said piston means bears, an actuator carried within said plunger for movements relative thereto between extended and retracted positions, and fluid port means independent of said compartments communicating with said plunger for enabling pressure fluid to flow into and out of said plunger, the presence or absence of fluid in said plunger respectively disabling or enabling relative movement of said plunger and said actuator.

4,619,593

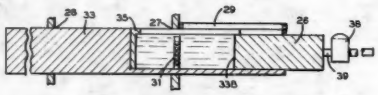
APPARATUS COMPRISING A TURBINE AND ASSOCIATED WATER EXTRACTOR AND METHOD OF TRANSLATING THE POTENTIAL ENERGY OF DEEP SEA WATER INTO USEFUL WORK

Steven Molnar, 111-09 Seventy Sixth, Forest Hills, N.Y. 11375

Continuation-in-part of Ser. No. 74,340, Sep. 11, 1979, abandoned. This application Oct. 1, 1981, Ser. No. 307,387

Int. Cl.[4] F04B *7/04*

U.S. Cl. 417—498 **7 Claims**



1. An apparatus for extracting fluid from a depressurized vessel comprising a closed tank adapted to contain a water level and a relatively large air cushion at low pressure

said tank having two openings formed in opposed wall portions thereof below the level of the fluid, one of said openings defining a port opening,

an external tank extension circumscribing said port opening and including valve means, valving said port opening,

said tank extension having valve means,

a fluid extracting means slidably mounted to reciprocate through said openings transversely of said tank and associated extension between a retracted and protracted position,

and a displacement cage associated with said tank extension and relative reciprocating movement with said extraction means and said tank extension,

said displacement cage having valving means complementing the valve means of said tank extension,

actuating means operatively connected to each of said respective valve means to co-ordinate the opening and closing of said valve means in a predetermined sequence so as to effect the extraction of the fluid from said tank to the exterior thereof,

and means for effecting the drive of said fluid extracting means between the protracted and retracted position.

4,619,594

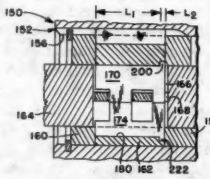
STACKABLE ROTARY VANE PUMP WITH IMPROVED VOLUMETRIC EFFICIENCY

Virginia S. Moir, Elyria, Ohio, assignor to Lear Siegler, Inc., Elyria, Ohio

Filed May 13, 1985, Ser. No. 732,940

Int. Cl.[4] F04C *8/00, 23/00*

U.S. Cl. 418—5 **28 Claims**



1. A pump assembly comprising a housing, a shaft mounted for rotation within said housing, a plurality of axially spaced pump units mounted on said shaft, each said pump unit including a cavity in said housing having an axis parallel to and offset from the axis of said shaft, a pair of end bearings defining opposite end faces of said cavity, said shaft carrying a plurality of radially slidable vanes engaging the wall of said cavity and defining pumping pockets as said shaft rotates, and positioning means for positioning said vanes axially in said cavity, said shaft having a uniform diameter at least through one of said cavities and associated end bearings, and said positioning means including wall means defining a circumferential groove extending radially outwardly of said one cavity, and tab means extending radially outward from each vane associated with said one cavity, said tab means being disposed in sliding sealing engagement within said groove.

4,619,595

CAPACITY CONTROL DEVICE FOR COMPRESSOR

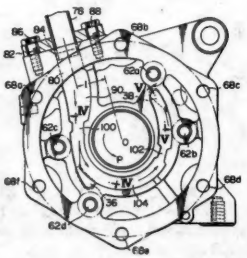
Keijiro Amano, Mito; Isao Hayase, Katsuta; Atsuo Kishi, Katsuta, and Noriharu Sato, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Automotive Engineering Co., Ltd., Katsuta, both of, Japan

Filed Apr. 16, 1984, Ser. No. 600,903

Claims priority, application Japan, Apr. 15, 1983, 58-65619

Int. Cl.[4] F04C *18/00*

U.S. Cl. 418—83 **3 Claims**



1. A compressor for an air conditioning system of an automotive vehicle, the compressor being adapted to be rotatably driven by an engine of the vehicle to cause a refrigerant to flow in circulation through a refrigeration cycle, the compressor comprising a rotary shaft, a cylindrical rotor secured to the rotary shaft, a cam cylinder housing said rotor and cooperating with the rotor to define at least one working chamber between an outer peripheral surface of the rotor and an inner peripheral surface of the cam cylinder, a pair of side plates located at axially opposite end portions of the cam cylinder to provide a seal to said working chambers at their sides, a side cover attached to a side of one of said pair of side plates, suction portions formed in one of said side plates and communicating with said working chamber, a refrigerant inlet passage formed in said side cover and connected at one end to a lower pressure line of the refrigerant cycle and at another end to the suction ports, a capacity control device comprising at least one flow resistance portion integrally formed in said side cover in said refrigerant inlet passage, said flow resistance portion functioning to reduce a volumetric efficiency of the compressor as the engine speed rises, and wherein said at least one flow resistance portion comprises a bent portion of the refrigerant inlet passage, the bent portion having a flow resistance characteristic equal to that of a restrictor of a cross sectional area which is about one-half a cross sectional area of the refrigerant inlet passage, the cross sectional area of the refrigerant inlet passage being measured at the connecting portion between the lower pressure line of the refrigeration cycle and the compressor.

4,619,596

SCREW TYPE COMPRESSOR

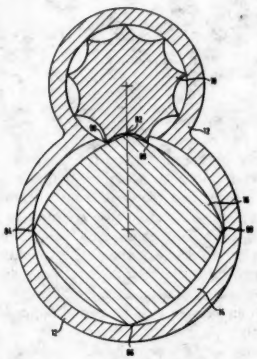
Karl-Heinz Dammann, Bielefeld, Fed. Rep. of Germany, assignor to Technika Beteiligungsgesellschaft mbH, Bielefeld, Fed. Rep. of Germany

Filed Oct. 12, 1982, Ser. No. 433,700

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1981, 3140108

Int. Cl.⁴ F04C *18/00*

U.S. Cl. 418—201 3 Claims



1. A parallel and outer axial rotating pistion compressor of the type comprising at least one driven helical main rotor and one auxiliary rotor meshing therewith, said main rotor including tooth surfaces configured as a layered circular helicoid defined by the helical generation of a circle about an axis, with the plane of the circle disposed perpendicular to such axis.

4,619,597

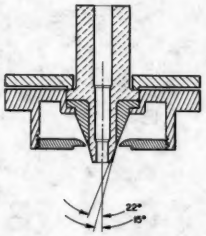
APPARATUS FOR MELT ATOMIZATION WITH A CONCAVE MELT NOZZLE FOR GAS DEFLECTION

Steven A. Miller, Amsterdam, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Feb. 29, 1984, Ser. No. 584,691

Int. Cl.⁴ B22F *9/08*

U.S. Cl. 425—7 4 Claims



1. A high temperature atomization nozzle comprising:

a melt delivery tube adapted to deliver a solid stream of melt, said tube being supported centrally of said nozzle for delivery of a melt to an atomization zone into which the melt delivery orifice end of said tube extends;

the outer surface of the orifice end of said tube having a concave configuration to deflect the flow of gas directed thereagainst; and

a gas delivery system including a gas nozzle for delivery of gas against the concave surface of said tube and into the melt exiting from said tube.

4,619,598

DOUGH FORMING DEVICE USED FOR MANUFACTURING CAKES

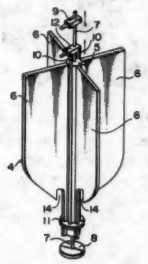
Kazuo Abe, Fukuoka, and Akira Shimamura, Kokubunji, both of Japan, assignors to Nisshin-DCA Foods Inc., Japan

Filed Sep. 27, 1985, Ser. No. 780,800

Claims priority, application Japan, Feb. 8, 1985, 60-16732[U]

Int. Cl.⁴ A21C *3/04, 11/18*

U.S. Cl. 425—131.1 3 Claims



1. In a dough forming device comprising a dough tank with a dough guiding hole, said hole having a lower end opening, a disc-shaped extrusion member being downward movable from the interior of the tank into the guiding hole, a disc-shaped cutting member being upward movable from a position in which it is positioned below the lower end opening to another position in which it is engaged with the lower end opening, and drive means for moving vertically the extrusion and cutting members, the downward movement of the extrusion member causing a volume of the dough to be expanded from the lower end opening along the upper surface of the cutting member, the upward movement of the cutting member causing the expanded volume of the dough to be cut off into a ring shape, the improvement wherein a separator for partitioning the interior of the dough tank inclusive of the dough guiding hole into a plurality of sector-shaped sections is arranged in the tank.

4,619,599

EXTRUSION HEAD

Adolf Herbert, Hanover; Klaus Bellmer, Ronnenberg, and Jobst Trocha, Hanover, all of Fed. Rep. of Germany, assignors to Hermann Berstorff Maschinenbau GmbH, Fed. Rep. of Germany

Filed Jul. 12, 1985, Ser. No. 754,177

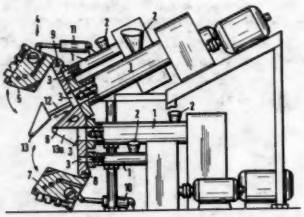
Claims priority, application Fed. Rep. of Germany, Feb. 22, 1985, 3506257

Int. Cl.⁴ B29C *47/18*

U.S. Cl. 425—186 6 Claims

1. An extrusion head for producing profiles from a plurality of plastics material or rubber mixtures comprising feed means, said feed means comprising an extrusion device for each said mixture, head means receiving each said mixture from said feed means, said head means comprising a central stationary portion, first and second outer head portions disposed one on each side of said central portion, pivot mounting means for each of said first and second outer portions, said pivot mounting means permitting pivotal movement of each said outer portions into and out of an operative position relative to said central portion, insert member means interposed between each of said outer portions and said central portion in said operative position of said outer portions, each said insert member defining, with at least one of said central portion and said first and second outer members, flow channels for respective ones of said mixtures

and means for displacing each said insert member in a direction generally away from said feed means when said outer portion adjacent thereto has been pivoted out of said operative position, said displacing means comprising a push-rod detachably affixed to said insert member and actuating means for displac-



ing said push-rod, said actuating means causing displacement of said push-rod and said insert member affixed thereto between a first position in which there is free access to said flow channels and a second position in which said insert member is interposed between said respective one of said outer portion and said central portion.

4,619,600

SIEVE DEVICE FOR CLEANING PLASTIC MELTS

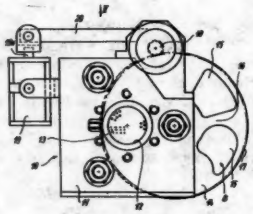
Detlef Gneuss, Am Hofen Ufer 2a, 4970 Bad Oeynhausen 1, Fed. Rep. of Germany

Filed Nov. 15, 1984, Ser. No. 671,831

Claims priority, application Fed. Rep. of Germany, Nov. 17, 1983, 3341508

Int. Cl.[4] B29C *45/17, 47/68*

U.S. Cl. 425—197 4 Claims



1. In a sieve device for cleaning plastic melts in a high-pressure press and having a plate-like housing with a flowthrough bore that constitutes part of a flow channel of the high-pressure press and a sieve disk positioned in the flowthrough bore, the improvement comprising sieve-cleaning means including a plate that rests against the sieve disk on the upstream side thereof and has several perforations therein, separated by webs, each measuring about 10% of the total area of one perforation, wherein the plate is disposed in the housing and projects to some extent out of the housing, and means mounting the plate for movement to align at least one perforation in the flow channel and while at least one perforation is outside of the housing.

4,619,601

PULSE COMBUSTOR

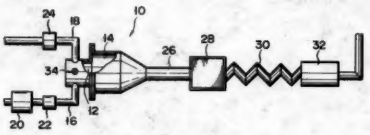
Shigeto Sumitani, Fuji, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 13, 1985, Ser. No. 765,263

Claims priority, application Japan, Aug. 29, 1984, 59-179633

Int. Cl.[4] F23C *11/24*

U.S. Cl. 431—1 5 Claims



1. A pulse combustor comprising:

a casing having therein a cylindrical mixing chamber closed at one end, and a combustion chamber communicating with the open end of the mixing chamber, said casing including a first air inlet hole opening to the peripheral surface of the mixing chamber, a fuel inlet hole opening to the peripheral surface of the mixing chamber and substantially opposite to the first air inlet hole, and a second air inlet hole opening into the mixing chamber downstream of said first air inlet hole toward said combustion chamber;

an air supply pipe connected to a source of air and connected to the first air inlet port for feeding air into the mixing chamber;

a pipe connected to a source of fuel and connected to the fuel inlet port for feeding fuel into the mixing chamber;

connecting means for connecting the second air inlet hole to the air supply pipe so that part of the air supplied through the air supply pipe is fed into the mixing chamber through the second air inlet hole; and means for producing pulse combustion in said combustion chamber.

4,619,602

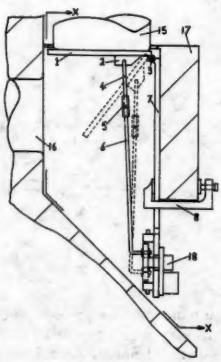
FAIL SAFE AUTOMATIC FLUE DAMPER MECHANISM

David M. Grant, 1 Autumn Court, Windsor, Ontario, Canada N9E 1R2

Filed Jan. 14, 1985, Ser. No. 691,471

Int. Cl.[4] F23N *5/02*

U.S. Cl. 431—20 2 Claims



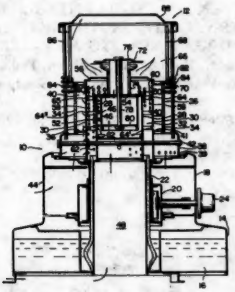
1. A flue damper mechanism fitted to and located within the draft hood of a gas furnace or other thermostatically controlled heating device, the damper being larger than and abutting the end of the flue where it leaves the draft hood, said damper having a hinge on one edge by which means it is

pivoted open and closed, the hinge of the damper being connected by a hinge pin, to hinge on a support member which is clamped to the inside of the draft hood, opening and closing of the said damper being controlled by a rod, one end of which is a second pivot that is hooked through a hole located in a flange, the flange is located underneath the damper on the damper centre line near the hinge, the control rod incorporating a safety feature, by which means it renders the damper open by a part of the control rod collapsing in the presence of too high a temperature in the draft hood, the other end of the control rod being located in the eccentric of a cam which is mounted on a shaft driven by a motor incorporating a speed reduction gear, the cam is rotated between two micro switches which are operated by the cam, and through electronic circuitry incorporating a relay and integrated with that of the furnace, or other heating device to which they are fitted, control the opening and closing of the damper.

4,619,603
COMBUSTION CYLINDER CONSTRUCTION FOR OIL BURNER

Kazuharu Nakamura, Nagoya, and Yutaka Nakanishi, Kounan, both of Japan, assignors to Toyotomi Kogyo Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,473
Claims priority, application Japan, Feb. 9, 1984, 59-22395
Int. Cl.⁴ F23D *5/00*
U.S. Cl. 431—201 **21 Claims**



1. A combustion cylinder construction for an oil burner of the heat radiation type comprising:

a multi-cylinder combustion means including an inner cylindrical member, an outer cylindrical member and a first heat-permeable cylinder disposed to surround said cylindrical members;

a combustion chamber provided above said multi-cylinder combustion means so as to be communicated with said multi-cylinder combustion means;

a flame spreading means arranged in said combustion chamber and above said inner cylindrical member; and

a second heat-permeable cylinder provided above said first heat-permeable cylinder to constitute a cylindrical side wall of said combustion chamber, said second heat-permeable cylinder being formed to have a diameter larger than that of said first heat-permeable cylinder and arranged to be substantially concentrical with said first heat-permeable cylinder;

said outer cylindrical member having a top plate which has a central opening and serves also as a bottom wall of said combustion chamber;

said outer cylindrical member being formed with a plurality of upper, middle and lower through-holes;

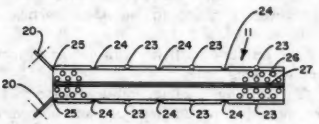
said top plate of said outer cylindrical member extending outward past the upper end of said first heat-permeable cylinder to the lower end of said second heat-permeable cylinder;

and said top plate of said outer cylindrical member being formed at the portion thereof between said first and second heat-permeable cylinders with a plurality of through-holes which allow air to be fed from the exterior of said combustion cylinder construction therethrough to the overall inner surface of said second heat-permeable cylinder.

4,619,604
FLAME RADIATOR STRUCTURE

Mark A. Pickering, Lebanon, Ind., assignor to Carrier Corporation, Syracuse, N.Y.

Continuation of Ser. No. 509,552, Jun. 30, 1983, abandoned. This application Jul. 22, 1985, Ser. No. 757,755
Int. Cl.⁴ F23D *14/02*
U.S. Cl. 431—353 **6 Claims**



1. A combustion flame tempering device for a gas-fired furnace for inhibiting formation of oxides of nitrogen by a combustion system of the gas-fired furnace, the combustion system having at least one monoport inshot burner supplied with a gaseous fuel which is burned to produce the combustion flame which is projected through an inlet opening into an air heat exchanger for the gas-fired furnace, the combustion flame having a peripheral area of relatively high peak temperatures conductive to the formation of oxides of nitrogen, said combustion flame tempering device comprising:

a perforated tubular main body section having open ends and sidewalls, having top and bottom edges, said sidewalls having longitudinal flanges at the top and bottom edges thereof, said flanges keeping said tubular main body section rigid and stable,

a plurality of ribs disposed on said sidewalls and being oriented generally perpendicular to the longitudinal flanges of said main body section, said ribs stiffening said sidewalls to prevent said main body section from bending relative to the combustion flame,

a plurality of oblong openings disposed on said sidewalls in alternating fashion with said ribs and substantially paralleling said ribs, said oblong openings allowing said main body section to expand and contract during thermal cycling,

said main body section being positioned generally at the peripheral area of the combustion flame where relatively high peak temperatures promote the formation of oxides of nitrogen, and being made of a temperature reducing material that absorbs heat energy from the peripheral area of the combustion flame to reduce the temperature of the flame below the high peak temperatures, thereby inhibiting the formation of oxides of nitrogen.

4,619,605

METHOD FOR THE THERMAL TREATMENT OF CALCAREOUS MINERAL RAW MATERIALS

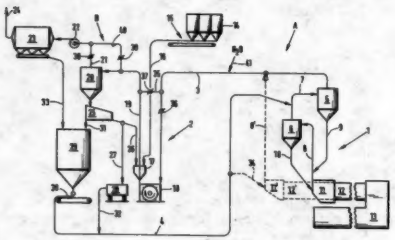
Horst Herchenbach, Hennef, and Hubert Ramesohl, Bergisch Gladbach, both of Fed. Rep. of Germany, assignors to Klöckner-Humboldt-Deutz AG, Fed. Rep. of Germany

Filed Dec. 14, 1984, Ser. No. 681,598

Claims priority, application Fed. Rep. of Germany, Dec. 14, 1983, 3345166; May 19, 1984, 3418685

Int. Cl.[4] F27B *15/00*

U.S. Cl. 432—14 **8 Claims**



1. A method for the thermal treatment of mineral raw materials containing calcium carbonate and the like for the production of a calcined product which comprises:

crushing and homogenizing said raw materials while still in the pit-wet condition to individual particles having a particle size below 200 mm,

drying the resulting particles with hot gases from a subsequent calcining zone,

thereafter crushing, grading, and drying the particles,

preheating said particles at a particle size of from 1 mm to 25 by direct heat exchange with hot gases while in suspension therein,

calcining the preheated particles in said calcining zone, under conditions of rapid heating sufficient to cause the carbonate containing materials to burst, resulting in the modification of their crystal lattices, expulsion of the water of crystallization, and ultimately to the expulsion of carbon dioxide,

sintering the calcined materials,

cooling the sintered materials, and

adjusting the mean grain size of said particles sent to preheating in response to their free lime content, the the grain size being decreased as the calcined product has a higher free lime content.

4,619,606

VERTICAL MALTDRYING KILN

Christian K. Numberger, Muhlberg 38 1/2, D-8257 St. Wolfgang, Fed. Rep. of Germany

Filed Feb. 7, 1985, Ser. No. 699,407

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1984, 3404804

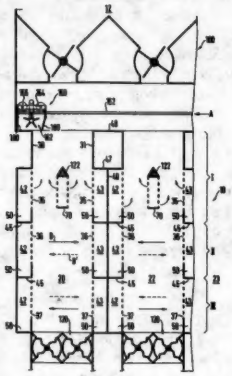
Int. Cl.[4] F27D *1/08*; F26B *17/12*

U.S. Cl. 432—99 **12 Claims**

1. In a vertical malt drying kiln, the improvement comprising:

(a) a plurality of compartments each having walls for containing malt to be dried and having means for supplying green malt at the top of said compartment and means for removing dried malt at the bottom thereof, each of said compartments divided into a plurality of vertically adjacent flow zones, each zone defined by the presence of a drying air flow originating in that zone; and

(b) means defining an air duct extending through the uppermost zone in said compartment, said air duct having perforated side walls for directing drying air transversely into



malt within said zone and thence upwardly and out the top of said compartment.

4,619,607

BAKING OVEN HAVING TURNTABLE DRIVEN FROM AN EXTERNAL MOTOR WHOSE DRIVE SHAFT IS COUPLED VIA A SEAL TO AN INTERNAL CHAIN

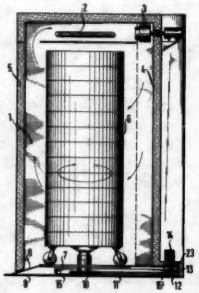
Helmut Schroder, Bietigheim-Bissingen, Fed. Rep. of Germany, assignor to Werner & Pfleiderer, Stuttgart, Fed. Rep. of Germany

Filed Aug. 28, 1985, Ser. No. 770,659

Claims priority, application Fed. Rep. of Germany, Aug. 28, 1984, 3431505

Int. Cl.[4] F27B *3/18, 9/16*; F26B *11/00*; A47J *37/10*

U.S. Cl. 432—162 **11 Claims**



1. In a baking oven heated by circulation of hot-air and having a baking compartment with a turntable above a bottom thereof adapted for receiving a multiple rack cart which carries the material to be baked and which is rotated around a vertical axis, the oven having a relatively narrow space below the turntable above said bottom, the turntable being provided with a drive gear therebelow disposed horizontally in said space and coupled to a horizontal chain which in turn is coupled to a pinion on a vertical shaft extending outside the baking compartment and driven by a drive motor, the improvement comprising

a chain box surrounding the chain and including a portion extending outside said baking compartment, said chain

box extending in said narrow space around said drive gear and said chain,

means for rendering said portion of said chain box which extends outside the baking compartment air-tight to prevent escape of vapor thereat from the baking compartment to the ambient atmosphere,

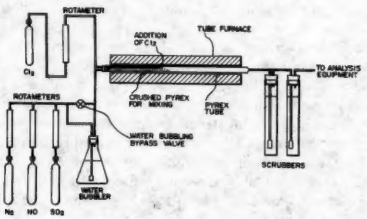
said vertical shaft extending into said portion of said chain box which is air-tight, and

means sealing said vertical shaft and said portion of the chain box which is air-tight such that the chain is sealingly enclosed, partially in the space beneath the baking compartment and partially in the air-tight portion of the chain box extending outside the baking compartment.

4,619,608
PROCESS FOR REMOVAL OF POLLUTANTS FROM WASTE GAS EMISSONS

Brian W. McIntyre, Vancouver, and John W. Biggar, Burnaby, both of Canada, assignors to ISCA Management Limited, Vancouver, Canada

Continuation-in-part of Ser. No. 610,505, May 15, 1984, abandoned. This application Oct. 18, 1985, Ser. No. 788,835
Int. Cl.[4] C01B *17/00*
U.S. Cl. 423—220 **23 Claims**



1. A process for oxidizing gaseous pollutants in a flue gas stream consisting essentially of flue gases, water vapor and one or more gaseous pollutants selected from the group consisting of SO_2, NO, NO_2, NO_x and H_2S, said oxidized form of the pollutants being more readily removable from the flue gas stream by water absorption than the non-oxidized form thereof, comprising injecting sufficient chlorine in a gaseous form, a liquid form, or as a water solution thereof into the said flue gas stream while the flue gas stream is at a temperature greater than 100° C. to react with the said pollutants and permitting the flue gas stream/chlorine mixture to react for a time sufficient to enable a significant amount of oxidation of the pollutants to occur, whereby an oxidized flue gas stream consisting essentially of flue gases, water vapor and one or more gaseous oxidized said pollutants is formed.

4,619,609
APPARATUS FOR THE ORTHODONTIC TREATMENT OF TEETH

William J. Clark, Lundin Lea, Leven Road, Lundin Links, Fife, KY8 6AJ, Scotland

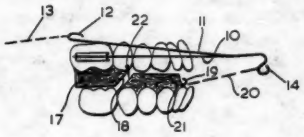
Division of Ser. No. 487,929, Apr. 22, 1983, abandoned. This application Dec. 21, 1984, Ser. No. 684,902
Int. Cl.[4] A61C *7/00*
U.S. Cl. 433—6 **4 Claims**

1. Apparatus for the orthodontic treatment of malocclusion of a patient whose closed upper and lower dental arches of natural teeth define an occlusal plane, said apparatus comprising:

(a) first and second cooperating bite blocks;

(b) means for securing said first and second bit blocks respectively to the upper and lower dental arches; and

(c) said upper and lower bite blocks having respective cam surfaces cooperating with each other and oriented with respect to the occlusal plane to exert opposing forces upon

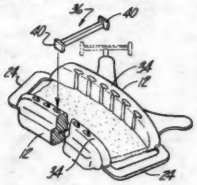


the upper and lower dental arches, whereby the occlusion therebetween is adaptively changed.

4,619,610
DENTAL IMPRESSION TRAY

Joseph J. Pelerin, 2027 Klingensmith, Bloomfield Hills, Mich. 48013

Filed Jul. 15, 1985, Ser. No. 754,944
Int. Cl.[4] A61C *9/00*
U.S. Cl. 433—41 **16 Claims**



1. A dental impression tray comprising:

a pair of spaced sidewalls forming a channel therebetween, and

means for connecting said sidewalls together comprising a layer of rigid material extending perpendicularly between said sidewalls at a midpoint of said sidewalls, said layer dividing said channel into a first subchannel and a second subchannel, said first subchannel adapted to receive a settable dental impression material

wherein said layer material is of a composition such that, when heated, said layer material is deformable in a direction perpendicular to the plane of said layer by a human biting into said layer and, when cooled, said layer material retains any deformations caused by a human biting into said layer, whereby a bite trace can be formed on said layer.

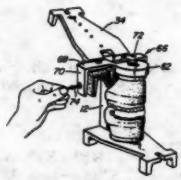
4,619,611
DENTAL ARTICULATOR

Henry Shimbashi, Box 2352, Towers Building, Drayton Valley, Alberta, Canada (T0E 0M0)

Filed May 24, 1985, Ser. No. 737,655
Claims priority, application Canada, Jul. 16, 1984, 458930
Int. Cl.[4] A61C *11/00*
U.S. Cl. 433—55 **3 Claims**

1. A dental articulator having a rigid, nonyielding structure for providing the occlusion plane required to build accurate intercuspation of teeth, said articulator comprising a lower mounting plate adapted to support a mandibular model, an upper mounting plate adapted to support a maxillary model, and a centre or spine post spacing said upper and lower mounting plates from one another; means rigidly securing the lower mounting plate to the lower end of said spine post; hinge means pivotally mounting the upper mounting plate to the top of the spine post and means for locking the upper mounting plate to the spine post in rigid, parallel location with respect to the lower mounting plate; an inner mounting plate and an outer

mounting plate adapted to support said maxillary model; means on said inner mounting plate for detachable securement to said spine post and means associated with said inner mounting plate to provide first horizontal and vertical marking surfaces respectively; said outer mounting plate comprising a central planar portion for attachment thereto of a mounting stone and maxillary model and means providing second horizontal and



vertical surfaces which, when said outer mounting plate is positioned on said articulator, are spaced from and correspond to said first horizontal and vertical marking surfaces of said inner mounting plate, and apertures in the vertical and horizontal surfaces of the outer mounting plate for the reception of marking means for applying marks to the surfaces of the inner mounting plate.

4,619,612

DENTAL SPRAY HANDPIECE

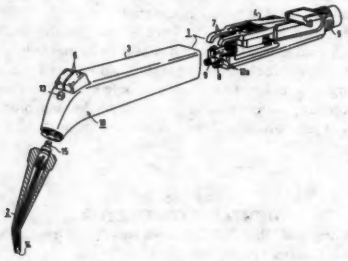
Walter Weber, Lorsch, and Doris Frank-Voeglein, Zwingenberg, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Oct. 12, 1984, Ser. No. 660,118

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337166

Int. Cl.[4] A61C *17/00*

U.S. Cl. 433—80 **20 Claims**



1. A dental spray handpiece for spraying an agent, the handpiece including a nozzle, a light source, a light conductor and a housing forming a grip piece for the dental handpiece, said nozzle at one end having a discharge orifice, said housing at one end having means for forming a connection with a supply line, said nozzle at a second end and the housing at a second end each having coacting connecting elements forming joint means for releasably connecting the nozzle and the housing together with rotational movement therebetween, said light source being provided in the handpiece adjacent to the joint means and said light conductor being centrally disposed in the nozzle and extending from adjacent the discharge orifice at the one end of the nozzle up to the joint means at the second end of the nozzle for receiving light from said light source.

4,619,613

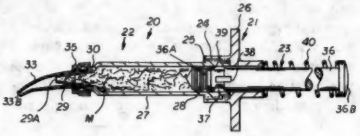
BULK DENTAL SYRINGE

William B. Dragan, 85 Burr St., Easton, Conn. 06612

Continuation-in-part of Ser. No. 388,649, Jun. 15, 1982, Pat. No. 4,492,576. This application Mar. 12, 1984, Ser. No. 588,290

Int. Cl.[4] A61C *5/04*

U.S. Cl. 433—90 **23 Claims**



1. A dental syringe for dispensing a predetermined amount of dental material directly to a tooth from a bulk supply of said material comprising

a barrel means defining an elongated tubular member adapted to contain a bulk supply of a dental material,

a discharge spout formed on one end of said tubular member, said tubular member being opened at its other end,

a plug sealing said opened end to confine a material within said tubular member,

means defining a plurality of flexible fingers connected to said tubular member, said fingers circumscribing said discharge spout,

said fingers having an internal retaining notch,

a nozzle tip detachably connected to said spout,

said tip having a laterally extending flange adjacent one end and a nozzle orifice formed at its other end,

said nozzle tip being fitted over said spout whereby said flange is engaged by said finger retaining notch for detachably retaining said nozzle tip on said spout,

and a collar slidably disposed relative to said fingers for positively securing said fingers in gripping relationship onto said nozzle tip,

a plunger slidably mounted within said tubular member for engaging said plug for extruding the dental material through said point and associated tip as said plug is displaced.

4,619,614

ROTATIONAL COUPLING DEVICE FOR A DENTAL HANDPIECE HAVING A BUILT-IN BATTERY

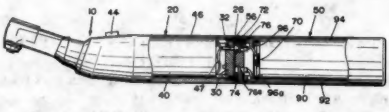
Tadashi Baba, Kanuma, and Norimasa Kaneko, Utsunomiya, both of Japan, assignors to Nakanishi Dental Mfg. Co., Ltd., Kanuma, Japan

Filed Aug. 31, 1984, Ser. No. 646,211

Claims priority, application Japan, Sep. 1, 1983, 58-135805[U]

Int. Cl.[4] A61C *1/02*

U.S. Cl. 433—99 **3 Claims**



1. A rotational coupling device for a cordless dental instrument comprising:

a motor housing and a battery housing which are detachably coupled together;

a direct current motor mounted in said motor housing and a charging battery mounted in said battery housing;

switch means, operatively connected to said direct current motor and mounted on said motor housing, for manually activating and deactivating said direct current motor;

said motor housing having a rear end with a circular opening

therein, a pair of semi-annular projections extending radially into said circular opening and a pair of arc-shaped recesses formed between the ends of said semi-annular projections;

a first insulating disc disposed in said circular opening and having two symmetrical, diametrically opposed apertures, each aperture having a lead wire extending therethrough, an end of said lead wire connected to said switch and an end of the other said lead wire connected to said motor, the other end of each said lead wire connected to a contact on said first insulating disc which projects from a surface of said first insulating disc facing said battery housing;

said battery housing having a forward end with a circular inlet therein, a pair of arc-shaped projections extending radially outward from said circular inlet and adapted to fit in said arc-shaped recesses in said motor housing, a pair of semi-annular flanges formed between said pair of arc-shaped projections and adapted to fit in said semi-annular projections of said motor housing, said arc-shaped projections being rotatable in said circular opening of said motor housing for engaging said semi-annular projections of said motor housing and detachably coupling said motor housing to said battery housing;

a second insulating disc disposed in said circular inlet of said battery housing and having two symmetrical, diametrically opposed arc-shaped guide slots which are adapted to receive said projecting contacts on said first insulating disc, one of said guide slots having a centrally disposed positive contact with a neutral and negative contact on either side thereof, the other of said guide slots having a centrally disposed negative contact with a positive and neutral contact on either side thereof, said neutral contacts being diametrically opposed to each other and said positive contacts being diametrically opposed to said negative contacts, said second insulating disc having a radially stepped peripheral portion engaged with a radially stepped portion of said battery housing for retaining said second insulating disc in said battery housing;

a lead wire connected between said negative contacts in said guide slots and a negative terminal of said charging battery, another lead wire connected between said positive contacts in said guide slots and a positive terminal of said charging battery; and

a positive and negative charging contact disposed on a rear end of said battery housing, each of which is connected to a respective positive and negative terminal of said charging battery.

4,619,615

EQUIPMENT FOR MONITORING COMBAT VEHICLES, ESPECIALLY TANKS

Wolfgang Kratzenberg, Staufenberg, Fed. Rep. of Germany, assignor to Wegmann & Co. GmbH, Kassel, Fed. Rep. of Germany

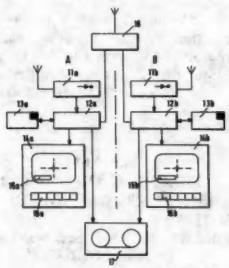
Filed Sep. 4, 1984, Ser. No. 647,077

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332582

Int. Cl.[4] G09B 9/00

U.S. Cl. 434—22 **15 Claims**

1. In equipment for monitoring two groups of combat vehicles in the practice firing of simulated rounds, wherein each combat vehicle has a weapon, a firing button for the weapon, a laser for emitting at least one pulse of light in a direction determined by the weapon when the firing button is actuated, an optical targeting device, an optical-pulse receiver for receiving a light pulse and a display connected to the optical pulse receiver for indicating the receipt of a pulse, the improvement comprising means for monitoring the combat vehicles at a director's post remote from the combat vehicles comprising in each combat vehicle: a television camera; optical adapting means coupling the optical targeting device to the television camera; video-transmitting means for transmitting the output of the television camera to the director's post; and means for modulating a control signal onto the transmitted video signal when the firing button is actuated; and comprising at the director's post at least two video receivers each assigned to one group of combat vehicles; one television monitor for each video receiver; switching means connecting each receiver to its associated monitor and controlled by the control signal for selecting the video signal displayed on the monitor,



the switching means comprising a priority circuit for applying the video signal from a selected combat vehicle in the group to the associated monitor when no firing button is actuated in any combat vehicle and for applying to the monitor for a given period of time the video signal emitted by a combat vehicle transmitting the modulated control signal.

4,619,616

WEAPON AIM-TRAINING APPARATUS

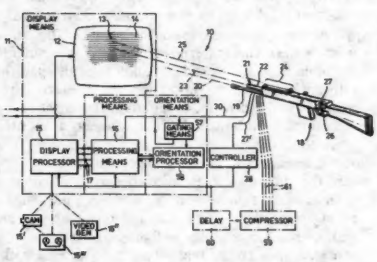
John J. Clarke, Cheadle Hulme, England, assignor to Ferranti plc, Cheshire, England

Filed Jun. 12, 1985, Ser. No. 743,900

Claims priority, application United Kingdom, Jun. 14, 1984, 8415148

Int. Cl.[4] F41G 3/26

U.S. Cl. 434—22 **21 Claims**



1. Weapon optical aim-training apparatus for a projectile firing type of weapon, said apparatus comprising

(i) display means, including a screen, arranged to display an image of a target,

(ii) a weapon means arranged to be directed at the screen and displaced therefrom at an operating position, said weapon including

(a) sighting means defining a sight-line axis which extends to, and intersects, the screen to define an aim point,

(b) photo-detection means having a field of view centred on a detection axis which extends to, and intersects, the screen at a detection point such that the detection point is displaced from the aim point in a known relationship, and

(c) switching means operatively connected to a trigger of the weapon,

(iii) control means responsive to operation of the switching means by actuation of the trigger to cause said display means to define on the screen, by the emission of optical radiation from a plurality of display element locations as a raster of lines of successively illuminated display element locations, a marker region smaller than the screen, but larger than the field of view of the photo-detection means, and displaced from the target image by said known relationship, and

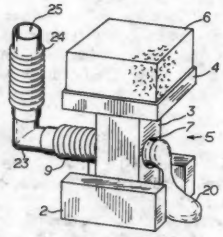
(iv) processing means responsive to the detection by the photo-detection means of optical radiation from said marker region of the screen to determine the position of the detection point with respect to the raster and thus the position of the aim point with respect to the position of the target image.

4,619,617

TEACHING AID FOR CPR

Cecil L. Rice, 2541 Windjammer Drive, Mississauga, Ontario, Canada L5L 1H7

Filed Aug. 12, 1985, Ser. No. 764,347
Int. Cl.[4] G09B *23/30*
U.S. Cl. 434—265 **9 Claims**



1. A teaching and practise aid for teaching and rehearsing cardio-pulmonary resuscitation (CPR) techniques, comprising:

a stand, having a base for resting on a flat surface, and a horizontal platform rigidly located above said base, said base and platform forming an integral structure;

a pad of foam material resting directly on top of said platform, where the material of the pad is resiliently compressible as to the vertical thickness of the pad through a substantial distance upon being pressed downwards towards said platform, to simulate the chest of a patient;

and a length of tubing, which is attached at an attachment point to the stand;

where one end of the tubing is left open;

where the tubing is so positioned and dimensioned and of such material that, at least a portion of the length of said tubing is vertically directed and terminates at said open end, and is substantially self-supporting;

where said open end of said tubing is so located with respect to said pad that said open end simulates the mouth of a patient;

and having a stretchable and inflatable balloon, the neck of which is fitted over the end of said length of tubing remote from said open end; and where said tubing provides a direct passage from said open end to said balloon and has no other openings.

4,619,618

FRESH WATER FLUSHING KIT

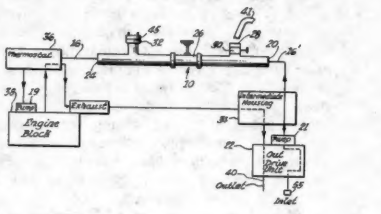
William Patti, 865 Robin Ct., Marco Island, Fla. 33937

Filed Apr. 12, 1985, Ser. No. 722,345
Int. Cl.[4] B63H *21/38*
U.S. Cl. 440—88 **4 Claims**

1. A fresh water flushing kit adapted for use only as an insertion in or as a permanent component in a cooling conduit system of an inboard marine engine system or an inboard/outboard marine engine system wherein the engine system includes an outboard cooling water hose water inlet, an outboard cooling pump, an intermediate housing including a passageway communicating with the pump, and an engine thermostat housing, said kit comprising:

a replacement conduit having an inlet means connectable to the outboard cooling water hose inlet via the intermediate housing;

said conduit including an outlet means connectable to the engine thermostat housing;



the conduit including an intermediate shut off valve means disposed between said inlet and said outlet means;

the conduit including a secondary outlet means with valve means disposed between said inlet means and said intermediate shut off valve means; and

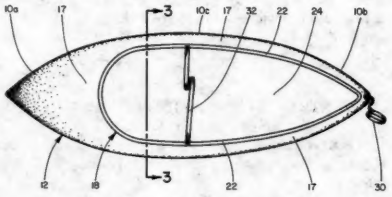
the conduit including a secondary inlet means for fresh water disposed between said outlet means and said intermediate shut off valve, said secondary inlet means including a closure means.

4,619,619

COMBINATION SURFBOARD-KNEEBOARD

Lauchlin M. Muse, Jr., P.O. Box 925, Dunn, N.C. 28334

Continuation of Ser. No. 499,360, May 31, 1983, abandoned.
This application May 20, 1985, Ser. No. 735,758
Int. Cl.[4] A63C *5/02*
U.S. Cl. 441—65 **1 Claim**



1. A combination surfboard-kneeboard comprising: an elongated buoyant board having front and rear end portions with said front end portion including a turned up nose, and a midarea located generally halfway between said front and rear end portions, said board being wider about the midarea than at said front and rear end portions and wherein the widest portion of said board is located between said midarea and said rear end portion; said board further including a lower base portion and a generally flat bottom with said lower base portion having an outer surrounding turned down rail structure and a raised upper deck formed over said lower base portion and extending from said midarea to said rear end portion; said raised deck having forward and side portions and including an inner rail structure indented from said outer turned down rail structure of said lower base portion and which extends around said forward and said side portions of said upper raised deck; said indented inner rail structure of said upper deck forming an angle with respect to said turned down rail of said lower base

portion and wherein said angle of said inner rail with respect to said turned down rail of said lower base portion varies from said midarea to said rear end portion, said raised upper deck including a formed cavity that lies inwardly from said raised inner rail structure with said cavity including a flat bottom that lies below the top of said inner rail structure; a resilient pad secured within said cavity formed in said upper deck; a plurality of detachable fins adapted to be detachably secured to the underside of the lower base portion of said board; a detachable knee strap detachably secured to said board and adapted to extend over the midarea thereof and operative to confine an individual's knees about said board when said board is being used as a kneeboard; and a detachable ankle strap detachably secured to said board for use when the same is being used as a surfboard.

4,619,620

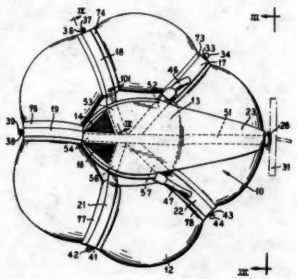
WATER SPORTS APPARATUS

Mark R. Felter, 2626 Indian Hill Rd., Cedar Rapids, Iowa 52403

Filed Mar. 19, 1985, Ser. No. 713,696

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—66 **1 Claim**



1. A water sport device comprising an inner tube which can be inflated and to which a plurality of holding pins are attached to its outer periphery, a seat portion of plastic material with a plurality of upper and lower straps extending therefrom, locking means attached to said upper and lower straps so that matching ones of said upper and lower straps can be connected around said inner tube by said locking means, said plaurlity of said upper and lower straps formed with openings that fit over said holding pins attached to said inner tube, transverse openings formed through said holding pins, locking split rings receivable in said transverse openings of said holdings pins so as to lock said straps to said inner tube, and a pair of towing portions extending from said seat portion and said inner tube so that they can be attached to a tow rope including tow rings attached to the ends of said pair of towing portions for receiving a tow rope therethrough, including at least one handle attached to one of said plurality of straps, wherein said inner tube is inflated after said plurality of straps are connected together to cause said inner tube to bulge out between said straps, and wherein there are five upper straps and five lower straps.

4,619,621

SURF RIDING AIR BAG

Harry E. Coleman, IV, P.O. Box #26, Arch Cape, Oreg. 97102

Continuation-in-part of Ser. No. 492,672, May 9, 1983, abandoned. This application Feb. 14, 1985, Ser. No. 701,777

Int. Cl.[4] A63C *15/00*

U.S. Cl. 441—66 **3 Claims**

1. A surf riding air bag comprising

a flexible inflatable container having a body portion closed at one end and open at its other end to form a filler opening,

said opening being substantially the full size of the bag to provide an enlarged filler opening,

said inflatable container being constructed of a cotton polyester type of material so as to be of light weight and readily inflated by wetting it and holding it up in the air with the enlarged filler opening catching air currents,

closure strap means secured to said bag adjacent the open end of the latter for wrapping around and closing said filler opening after inflating the bag,

said bag being sufficiently elongated from end to end to carry a person lying crosswise thereon for riding a wave in the surf and to partially wrap around the person lying thereon,

and handle means adjacent each end of said bag for obtaining a riding hold on the bag by a person lying crosswise thereon.

4,619,622

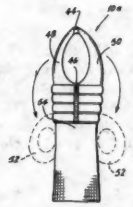
SWIM SAFE PLAY SUIT

Edith N. McDonald, and George Spector, both of 233 Broadway, Rm. 3615, New York, N.Y. 10007

Filed Oct. 13, 1983, Ser. No. 541,780

Int. Cl.[4] B63C *9/10*

U.S. Cl. 441—111 **1 Claim**



1. A buoyant swim suit having an upper portion and a lower portion, said upper portion having a plurality of substantially equi-spaced, parallel, flexible and waterproof hollow air chambers retained there within and shoulder portions extending over the shoulders of the wearer, said lower portion being comprised of ordinary swim suit material, said swim suit further comprising separable fastening means on said shoulder portions and respective sides of said upper portion to thereby form front and rear upper portions, whereby said front and rear upper portions can be rolled downward to form a life preserver about said wearer's mid section.

4,619,623

LIFE-JACKET ASSEMBLY

Bernt Elverskog, Upplands Väsby, Sweden, assignor to KB Elverskog Ide & Konstruktion, Upplands Väsby, Sweden

Filed Dec. 14, 1984, Ser. No. 681,815
Claims priority, application Sweden, Dec. 16, 1983, 8307002
Int. Cl.[4] B63C *9/00*
U.S. Cl. 441—126 8 Claims

1. In a chair for a transportation vehicle, said chair including two armrests, a covered seat bottom and a covered backrest (3) extending upward from said seat bottom, the improvement wherein:

said covered backrest extending forward only to substantially the back of the seat bottom and defining a cavity therein, said cavity completely surrounding a life jacket assembly, said covered backrest having an openable upper end portion for providing access to said cavity; and wherein

said cavity contains substantially entirely therein said life jacket assembly, said life jacket assembly comprising an elongated, essentially flat, buoyant body (7), substantially made of buoyancy material, an end surface of said life jacket assembly being provided with a pull handle (6), said pull handle being proximate to and accessible from said openable end portion when said openable end portion is open, said buoyant body (7) defining, at a distance from said end provided with said pull handle (6), an opening (8) adapted for the passage of a user's head therethrough,

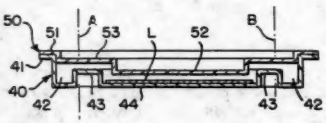
whereby said life jacket assembly may be withdrawn from said cavity and secured about the body of said user, with said head of said user extending through said opening (8), while said user is seated in said chair.

4,619,624

METHOD OF MAKING IMPROVED ELECTROLUMINESCENT PANELS

Charles Kerr, III, 120 Knox Rd., and Mark Forell, 18 Highland Dr., both of East Aurora, N.Y. 14052

Division of Ser. No. 548,972, Nov. 7, 1983, Pat. No. 4,578,617.
This application Sep. 30, 1985, Ser. No. 781,346
Int. Cl.[4] B29C *43/18*
U.S. Cl. 445—22 5 Claims



1. A method of producing an electroluminescent panel for instruments and the like, comprising

preparing a first, light transmissive shell having in the back thereof a pair of spaced recesses, one of which surrounds a projection on said first shell,

preparing a second shell having therein a first recess for accommodating the projection on said first shell, and having around said first recess a projection complementary to said one recess in said first shell,

placing an electroluminescent lamp element in said one recess in said first shell and filling the remainder of the last-named recess with a fluid potting material to cover said element, and

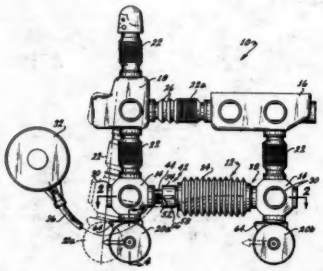
molding the two shells together by pressing said second shell into the back of said first shell to have the projection on said second shell overlie said element and force excess potting material out of said one recess into the other recess in said first shell.

4,619,625

CONSTRUCTION TOY

Yoshizo Seki, Tokyo, Japan, and Sidney Bass, Los Angeles, Calif., assignors to Tomy Kogyo Co. Inc., Tokyo, Japan

Filed Jun. 14, 1985, Ser. No. 745,406
Claims priority, application Japan, Sep. 18, 1984, 59-141502[U]
Int. Cl.[4] A63H *33/04*
U.S. Cl. 446—89 14 Claims



1. A construction toy which comprises:

a first module, said first module including a bellows, said bellows having ends, said bellows including a connector located at each of its ends, said bellows having a closed hollow interior with a single opening providing ingress and egress into the interior of said bellows;

said first module further including an elongated hollow tube having ends, one of said ends of said tube attachable sealing to said bellows opening;

said first module further including a hollow bulb having a single opening, said bulb compressable, said opening of said bult attachable sealing to other of said ends of the tube, together said bulb, said tube and said bellows forming a closed fluid system whereby compression on said bulb elongates said bellow, and release of said compression on said bulb shortens said bellows;

at least two second modules, each of said second modules including at least two connectors located thereon, the connectors on the ends of said bellows each attachable to one of the connectors on one of said modules so as to temporarily connect one of the ends of said bellows to one of said second modules and the other of said ends of said bellows to the other of said second module;

at least two third modules, each of said third modules having a base member, an axle, a first and a second wheel and a ratchet means;

said base member including a connector located thereon, said connector on said base member connectable to one of said connectors on said second module so as to temporarily connect one of said third modules to one of said second modules;

said axle journalled in said base member and including said first and said second wheels located on the ends of said axle on opposite sides of said base member, said ratchet

means operatively associated with said base member and at least one of said wheels whereby said wheels is capable of rotating in a first direction and is inhibited from rotating in a second direction.

4,619,626

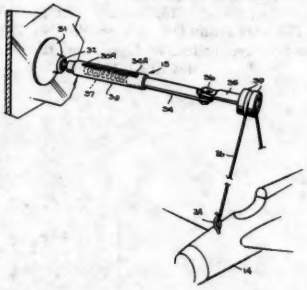
SUPPORT AND TETHERED AMUSEMENT DEVICE

Gerald Tarulli, 29 Godfrey Rd. West, Weston, Conn. 06883

Filed Jan. 31, 1985, Ser. No. 696,587

Int. Cl.[4] A63H *21/02*

U.S. Cl. 446—228 **2 Claims**



1. A toy for permitting an operator to attempt to control the position of an object relative to a contour of variable elevation while the toy and operator move relative to the contour, comprising, in combination:

a support including a sleeve, an arm projecting outwardly of one end of said sleeve and telescopically movable relative to said sleeve, means urging said arm to its full extension relative to said sleeve, a finger pivotally connected at one end to the distal end of said arm;

line bearing means carried by said finger and comprising spaced members of greater radial dimension than said finger to support the line therebetween;

means associated with said support for fixing said support at a given height relative to an operator;

an object to be moved between different heights relative to said support; and

a flexible line fixed at one end to said object, looping around said finger between said spaced members and then through line guide means associated with said object and terminating in a free end for manipulation of said object relative to a variable contour more distant from said operator than said object, said contour and object being within the operator's field of view,

whereby the operator may sight along the object and control the spatial relationship of the object and contour in his field of view as the contour moves relative to the object and operator by manipulation of the free end of said flexible line.

4,619,627

FLUIDIC SHAFT COUPLING ASSEMBLY

Jochen Balken, Lindau; Wolfgang Beigang, Siegburg, and Bernhard Bihr, Neunkirchen, all of Fed. Rep. of Germany, assignors to Uni-Cardan Aktiengesellschaft, Siegburg, Fed. Rep. of Germany

Filed Nov. 2, 1984, Ser. No. 667,536

Claims priority, application Fed. Rep. of Germany, Nov. 11, 1983, 3340966

Int. Cl.[4] F16D *3/80*; F16C *3/02*

U.S. Cl. 464—24 **25 Claims**

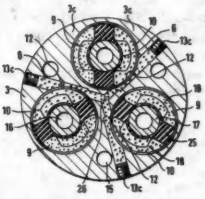
1. An elastic constant velocity torque transmitting coupling including a first hub member, a second hub member and a joint assembly elastically joining said first and second hub members in torque transmitting engagement, said joint assembly comprising:

a first and a second fluid system each containing a fluid medium which is adapted to be placed under pressure during torque transmission between said first and second hub members;

said first fluid system including a first plurality of individual fluid chambers and a first plurality of channels connecting said first plurality of chambers in flow communication;

said second fluid system including a second plurality of individual fluid chambers and a second plurality of channels connecting said second plurality of chambers in flow communication;

said first and said second plurality of channels being axially offset relative to each other and extending outwardly,



respectively, from a first and a second common point at which said first and second plurality of channels, respectively, are placed in flow communication with each other; and

throttling means in each of said first and second fluid systems resisting the flow of fluid media therein;

said joint assembly comprising a generally cylindrical body member defining a central axis and having a plurality of axially extending bores therein with a plurality of inserts being arranged one within each of said bores, said first and second plurality of fluid chambers being defined between said inserts and the inner surface of said bores and said first and second plurality of channels being defined to extend through said cylindrical body member radially relative to said central axis.

4,619,628

ARRANGEMENT OF TWO ELEMENTS WHICH UNDERGO AN ALTERNATING SLIDING MOTION AND ITS APPLICATION IN A SLIDABLE TRIPOD JOINT

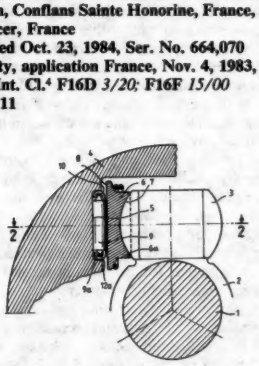
Michel A. Orain, Conflans Sainte Honorine, France, assignor to Glaenzer Spicer, France

Filed Oct. 23, 1984, Ser. No. 664,070

Claims priority, application France, Nov. 4, 1983, 83 17578

Int. Cl.[4] F16D *3/20*; F16F *15/00*

U.S. Cl. 464—111 **7 Claims**



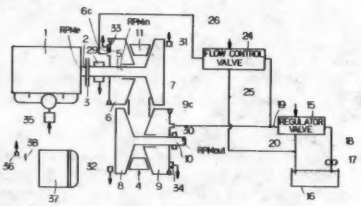
1. An arrangement comprising a planar raceway and a slide which are capable of undergoing a reciprocating motion with

respect to each other in directions parallel to said raceway, rolling members between the raceway and slide, a cage generally parallel to said raceway and having ends on opposite sides of said slide, said cage maintaining the rolling members in position, and spring means connected between only said slide and said cage for maintaining said slide centrally disposed relative to said cage, said spring means consisting of a return spring having a substantially flat configuration having a mean plane parallel to said raceway and comprising a wire of resilient metal defining at least one coil surrounding said slide and two end arm portions which extend from said coil to ends remote from said coil, and connecting means for connecting said end arm portions to respective ends of said cage.

4,619,629
HYDRAULIC PRESSURE CONTROL APPARATUS FOR A CONTINUOUSLY VARIABLE TRANSMISSION

Takashi Shigematsu; Setsuo Tokoro, and Tomoyuki Watanabe, all of Susono, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Japan

Filed May 3, 1984, Ser. No. 606,523
Claims priority, application Japan, Jul. 26, 1982, 57-128878; 57-128880.
Int. Cl.⁴ F16H *11/06*
U.S. Cl. 474—28 **16 Claims**



1. A hydraulic pressure control apparatus for a continuously variable transmission, the transmission including a driving pulley having a fixed member and a movable member, the movable member being actuated by a hydraulic cylinder to form a V-shaped opening between the movable member and the fixed member, a driven pulley having another fixed member and another movable member, said another movable member being similarly actuated by another hydraulic cylinder to form a similar V-shaped opening between said another movable member and said another fixed member, and a belt member spanning said driving and driven pulleys such that an effective diameter of the driving and driven pulleys can be varied with respect to each other to obtain different speed ratios, the hydraulic pressure control apparatus comprising:

a first pressure detecting means in communication with the hydraulic cylinder of the driving pulley for detecting a pressure of the hydraulic cylinder of the driving pulleys, the first pressure detecting means outputting a first pressure signal having a first value;

a second pressure detecting means in communication with another hydraulic cylinder of the driven pulley for detecting the pressure of said another hydraulic cylinder of the driven pulley, the second pressure detecting means outputting a second pressure signal having a second value;

a storing means for storing a predetermined value;

a calculating means for calculating a third value, said calculatinng means being in communication with said first and second pressure detecting means and said calculating means receiving the first and second pressure signals from the first and second detecting means, said calculating means using said value of said first signal and said value of said second signal to calculate said third value, said calculating means outputting a signal having said third value;

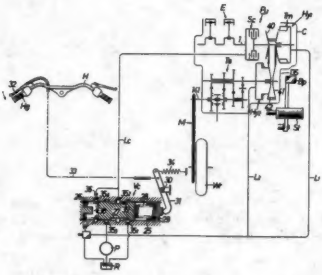
a comparison means for comparing said third value with said predetermined value, said comparison means being in communication with said storing means and said calculating means, the comparison means outputting a resultant signal; and

an adjustment means for changing the pressure of the another hydraulic cylinder of the driven pulley in accordance with the resultant signal, said adjustment means being in communication with said another hydraulic cylinder and said comparison means.

4,619,630
BELT TYPE CONTINUOUS REDUCTION GEAR MECHANISM

Torao Hattori, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 428,715, Sep. 30, 1982, Pat. No. 4,560,369.
This application Oct. 2, 1985, Ser. No. 782,792
Claims priority, application Japan, Dec. 10, 1981, 56-198796
Int. Cl.⁴ F16H *9/00*
U.S. Cl. 474—72 **7 Claims**



1. A belt type continuous reduction gear mechanism comprising: a drive V-pulley; a driven V-pulley; and a V-belt made to run under tension between said two V-pulleys, wherein said drive V-pulley is arranged coaxially with a start clutch, which is arranged coaxially with the crankshaft of an engine and is constructed of a hydraulic multi-disc clutch, and has its external diameter reduced to substantially the same as that of said start clutch thereby to set the reduction ratio range at a relatively small value, and wherein said driven V-pulley is connected to an auxiliary reduction gear mechanism of plural-step type for compensating the shortage of said reduction ratio range.

4,619,631
CONTROL MEANS FOR SHIFTING GEARS ON DUAL SHIFT BICYCLES

Jack B. Darby, 518 First St. E., Scott City, Mo. 63780

Filed Jul. 3, 1985, Ser. No. 751,583
Int. Cl.⁴ F16H *9/00*
U.S. Cl. 474—80 **24 Claims**

1. In a device such as a dual shift bicycle or the like having a plurality of drive gears and including a drive chain means, a front derailleur associated with a front drive gear means and movable to positions for shifting the drive chain means into selected drive positions, a rear derailleur associated with a rear drive gear means and movable to positions for shifting the drive chain means into selected drive positions, a front derailleur shift means operatively connected at one end to the front derailleur and movable for positioning the front derailleur, and rear derailleur shift means operatively connected at one end to the rear derailleur and movable for positioning the rear derailleur, the improvement comprising:

means for shifting between the drive positions by moving the front and rear derailleur shift means to position the front and rear derailleurs, including

control means including a front control member movable through shifting movements between a plurality of con-

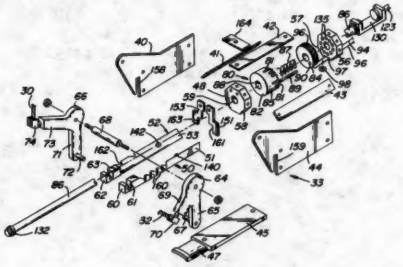
trol positions and a rear control member movable through shifting movements between a plurality of control positions,

said front derailleur shift means including a front cable extending between said front derailleur and said control means and being spring biased at the front derailleur end thereof to be maintained in a tensioned condition,

said rear derailleur shift means including a rear cable extending between said rear derailleur and said control means and being spring biased at the rear derailleur end thereof to be maintained in a tensioned condition,

means providing operative engagement between the control means end of said front cable and said front control member,

means providing operative engagement between the control means end of said rear cable and said rear control member,



selector/actuator means for selecting for each of said front and rear control members a selected control position to which said front and rear control members are to be moved in a gear shifting movement from a present control position to a selected control position and engageable with said front and rear control members for actuating the same through said shifting movement,

said control position selection operation being independent of said actuation of said control members through said shifting movement so that the shifting between the drive gears can be performed in two sequential operations,

and means for holding said front and rear control members in selected control positions thereof against said biased movement thereof.

4,619,632

REAR DERAILLEUR FOR A BICYCLE

Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Aug. 5, 1985, Ser. No. 762,404

Claims priority, application Japan, Aug. 8, 1984, 59-122365[U]

Int. Cl.[4] F16H *9/00*

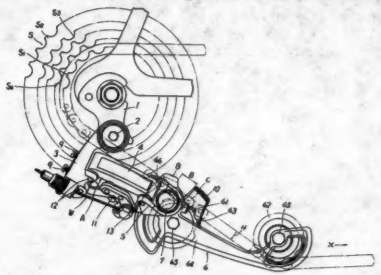
U.S. Cl. 474—80 **3 Claims**

1. A rear bicycle derailleur for switching a driving chain to a selected sprocket of a multistage sprocket assembly of a bicycle, said derailleur comprising:

a chain guide comprising a guide pulley, a tension pulley and first and second plates supporting said guide pulley and said tension pulley, and

a derailleur body having a movable member supporting said chain guide and support means supporting said movable member to be movable axially of said multistage sprocket assembly.

said first plate comprising a first restrainer at a side of said first plate adjacent said derailleur body, said first restrainer being positioned radially outwardly relative to said guide pulley at a location outside a first predetermined chain movement path along which said chain travels from a high speed sprocket of said multistage sprocket assembly to said tension pulley through said guide pulley when said multistage sprocket assembly rotates in reverse,



whereby said chain is prevented from moving away from said first chain movement path when said multistage sprocket assembly rotates in reverse.

4,619,633

DERAILLEUR FOR A BICYCLE

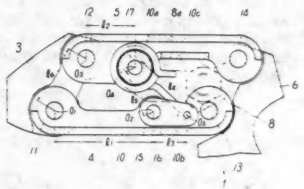
Masashi Nagano, Izumi, Japan, assignor to Shimano Industrial Company Limited, Osaka, Japan

Filed Jun. 21, 1985, Ser. No. 747,222

Claims priority, application Japan, Jun. 28, 1984, 59-134936

Int. Cl.[4] F16H *9/00*

U.S. Cl. 474—82 **6 Claims**



1. A bicycle derailleur, comprising:

a linkage mechanism comprising a base member, a movable member, and first and second linkage members supporting said movable member to said base member, such that said movable member is reciprocably movable relative to said base member;

an operating means for moving said movable member in a first direction with respect to said base member;

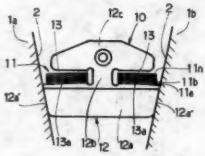
a return spring for biasing said movable member in a second direction opposite to said first direction with respect to said base member; and

a control means for reducing a variation in a biasing force of said return spring at a starting position and a terminal position of movement of said movable member in said first direction, said control means comprising a swingable member pivoted to one member of said linkage mechanism and a support shaft disposed at another member of said linkage members which is opposite to said one member, said spring having a coiled portion supported to said support shaft and first and second spring legs extending from both ends of said coiled portion, said first spring leg being retained to said swingable member, said second spring leg being retained to said another member, whereby a variation in a torsion angle of said spring is reduced with respect to a variation in a movement stroke from said starting position to said terminal position of said movable member in said first direction.

4,619,634
TORQUE TRANSMITTING BELT

Yasunori Nakawaki, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Mar. 4, 1985, Ser. No. 707,821
Claims priority, application Japan, Mar. 14, 1984, 59-050026
Int. Cl.[4] F16G *1/24*
U.S. Cl. 474—201 12 Claims



1. A torque transmitting belt employed in a continuously variable transmission means for transmitting a torque between an input pulley and an output pulley, comprising:

an endless carrier including a plurality of hoops extending between and contacted around peripheral portions of said input and output pulleys;

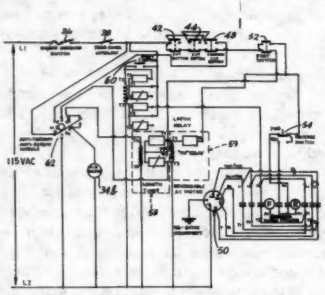
a plurality of block members being longitudinally shiftable along the hoops, each of said plurality of block members including a head portion, a main portion and a neck portion, said neck portion connecting the main portion with the head portion, wherein the neck, head and main portions cooperate to form a groove, the endless carrier extending through said groove; and

at least one of said plurality of hoops having an inner side with an inner circumferential length and an outer side with an outer circumferential length, said inner side facing said neck portion of the block member, said inner circumferential length being greater than said outer circumferential length.

4,619,635
AUTOMATIC FEED CIRCUIT FOR DUNNAGE CONVERTER

Gary W. Ottaviano, Bedford Heights, Ohio, assignor to Ranpak Corp., Willoughby, Ohio

Filed Nov. 4, 1985, Ser. No. 794,558
Int. Cl.[4] B31B *1/00*
U.S. Cl. 493—36 14 Claims

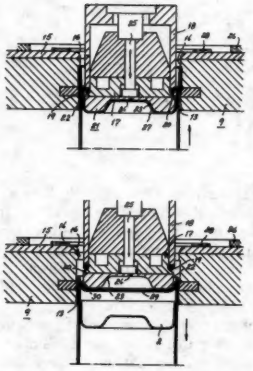


1. In a mechanism for producing relatively low density pad-like cushioning dunnage product in strip form from flexible sheet-like stock material comprising a support frame, means on said support frame for pulling sheet-like stock material from a supply roll thereof into said mechanism and causing inward rolling of the lateral edges of the sheet-like stock material to form a pad-like product having lateral relatively resilient pillow-like sections and a central connecting section holding the pillow-like sections together in generally side-by-side relation and running generally lengthwise of the product, said means being also operable to emit the produced pad-like product from said mechanism, said means including an electric motor and settable control means operatively coupled to said motor and providing for selectively programming said motor for actuation thereof for a selected one period of time of a predetermined plurality of periods of time, whereby the pad-like product can be automatically produced by said mechanism for said selected one period without any further action on the part of a machine operator.

4,619,636
METHOD AND APPARATUS FOR MANUFACTURING CONTAINER HAVING BELLOWS BOTTOM AND LID

Ingemar S. B. Bogren, 193 00 S., Sigtuna, Sweden

PCT No. PCT/SE84/00181, § 371 Date Jan. 7, 1985, § 102(e) Date Jan. 7, 1985, PCT Pub. No. WO84/04510, PCT Pub. Date Nov. 22, 1984
PCT Filed May 15, 1984, Ser. No. 694,672
Int. Cl.[4] B31B *1/90, 17/46*
U.S. Cl. 493—109 15 Claims



8. Apparatus for manufacturing a container comprising a tubular sleeve (1) having a bellows bottom (2) and a protection lid (3), both of which are mounted within said sleeve (1) in axially spaced apart relationship from each other and secured to the inner wall of said sleeve by a thermoplastic adhesive, said apparatus comprising:

a carrier (9) having an opening therethrough;

means for supporting a sleeve (1) at a predetermined position in said opening;

welding means (10) disposed adjacent said opening for effecting melting of a thermoplastic adhesive;

a plunger (11) and means associated therewith for moving said plunger (11) between a retracted position on one side of said carrier (9) and a predetermined extended position within said opening, said plunger (11) defining means in association with said sleeve supporting means for inserting a bellows bottom (2) blank and a protection lid (3) blank one at a time into said sleeve (1) into axially spaced apart relationship from each other;

means for supporting a bellows bottom (2) blank and a protection lid (3) blank between said carrier (9) and said plunger (11) when said plunger (11) is in said retracted position;

and means in said opening to effect pressing of a blank already within said sleeve (1) against the inner wall of the sleeve (1) in said opening while said thermoplastic adhesive is melted.

15. Apparatus for manufacturing a container that comprises a substantially tubular sleeve and axially inner and outer clo-

sures at one end of the sleeve, each formed from a flat blank having a central portion and a marginal portion that is bent axially outward from said central portion and is secured to the sleeve around an inner surface thereof, said axially inner closure being supple and having its central portion of bellows-like form to accommodate expansion and contraction of container contents and said axially outer closure being substantially stiff and having a substantially flat central portion, said apparatus comprising a carrier means having an opening which has an upright axis for closely receiving and radially confining a sleeve, a welding ring means on the carrier means coaxially surrounding said opening for fusing coatings on a sleeve and on a closure to bond them, positioning means cooperating with the carrier means to releasably confine a sleeve in said opening against axial displacement relative to the carrier means, and means comprising a plunger having an axis coinciding with the axis of said opening and movable relative to the carrier means downwardly into and upwardly out of said opening for forming closures from flat blanks and inserting them into sleeves in the carrier means, said apparatus being characterized by:

(a) said plunger comprising

(1) an upper part having an annular and coaxial downwardly facing surface,

(2) a lower part which is confined to limited up and down motion relative to said upper part and which

(a) defines a bottom surface on the plunger and

(b) has an annular upwardly facing surface which is spaced above said bottom surface and which opposes said annular downwardly facing surface and cooperates with the latter in defining a radially outwardly opening groove around the plunger that is narrowed by upward movement of the lower part relative to the upper part, and

(3) means for clamping the sleeve and closure to said welding ring means, comprising a resilient ring in said groove, said upper and lower parts defining means for radially outwardly expanding said ring by axially compressing said ring by narrowing said groove;

(b) said bottom surface on the plunger having

(1) a central downwardly opening cavity and

(2) a coaxial annular area surrounding said cavity that lies in a single plane normal to the axis of the plunger; and

(c) said plunger having means therein comprising a suction passage, one end of which is connectable with a vacuum source and the other end of which opens to said cavity for drawing up into the cavity the central portion of a supple closure to impart bellows-like form thereto.

4,619,637

CARTON FORMING APPARATUS

Kenneth W. Jones, 615 Quail Run, Middletown, Ohio 45042

Filed Jun. 3, 1985, Ser. No. 740,638

Int. Cl.[4] B31B *1/28*

U.S. Cl. 493—175 **4 Claims**

1. Carton forming apparatus comprising:

an endless chain having spaced lugs for feeding carton blanks;

a rotary former rotatably mounted at the downstream end of said endless chain;

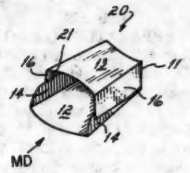
said former having means to grasp a carton blank and a mandrel over which said carton blank is partially formed;

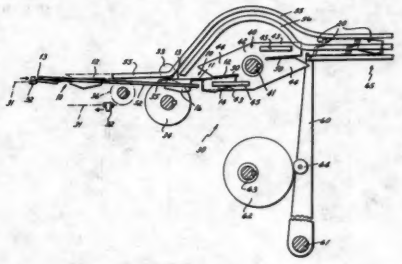
arcuate plows overlying said former in a position to engage said carton blank and effect partial folding of it as said former rotates through 180°;

a hopper located downstream of said former for receiving completed cartons;

and a kicker bar mounted at the downstream side of said rotary former, means connected to said kicker bar for reciprocating said kicker bar to engage the trailing edge of a carton blank and thrust it into said hopper;

said former having two slots on diametrically-opposite sides thereof;





each slot defining, in part, said mandrel adjacent said slot; said slot forming said blank-grasping means.

4,619,638

SPLAYED ROLL FOLDER FOR ADHESIVE APPLICATION

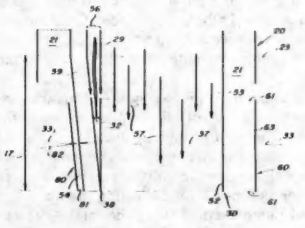
F. John Herrington, Holcomb, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 297,523, Aug. 28, 1981, Pat. No. 4,419,087.

This application Sep. 30, 1982, Ser. No. 429,372

Int. Cl.[4] B31F *1/00*

U.S. Cl. 493—439 **2 Claims**



1. A method for pleating a continuously advancing flexible sheet of indeterminate length, comprising the following steps:

A. passing said sheet as a reach from a line of departure to a line of arrival; and applying selectively varied tension to said sheet at least at said line of departure and obliquely relative to said line of departure

B. passing said sheet under tension and over a composite peripheral surface from said line of arrival to a pinch zone, through a peripheral distance subtended by a peripheral angle of from 45° to 180° defined by said peripheral surface and over a circularly converging gap having a pleat angle of from about 0.25° to about 5° and ending at said pinch zone and;

C. forcing a strip of said sheet into said gap by means of said

oblique tension on said sheet so as to form in said sheet a pleat parallel with the edges of said sheet.

4,619,639

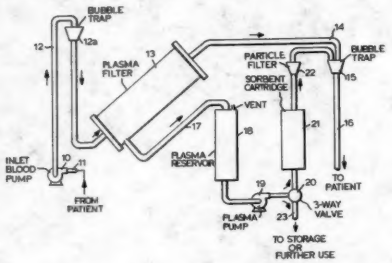
METHOD AND APPARATUS FOR LOW PRESSURE FILTRATION OF PLASMA FROM BLOOD

Yukihiko Nosé , Cleveland Heights, and Paul S. Malchesky, Painesville Township, Lake County, both of Ohio, assignors to Asahi Medical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 417,914, Sep. 14, 1982, abandoned, which is a continuation of Ser. No. 179,224, Aug. 18, 1980, Pat. No. 4,381,775, which is a continuation-in-part of Ser. No. 118,677, Feb. 5, 1980, abandoned. This application Sep. 11, 1985, Ser. No. 775,097

Int. Cl.[4] A61M *1/03*

U.S. Cl. 604—6 **10 Claims**



1. An apparatus for carrying out separation of plasma from whole blood, comprising:

a filtration membrane means of a material suitable for separating plasma from whole blood and having a whole blood face and a filtrate face on opposite sides thereof and a pore size from 0.1 to 0.6 microns and having an inlet and an outlet on opposite ends of the whole blood face thereof;

a bubble trap connected to the inlet of said membrane means;

a first pump means adapted to be connected to a patient and having the discharge end connected to said bubble trap for directing blood from a patient through said bubble trap and across said whole blood face of said membrane means at a flow velocity of from 5 to 1500 cm/min and at a depth sufficient for enabling separation of plasma from the blood;

a plasma conduit means having the upstream end connected to the filtrate face of said membrane means for receiving plasma from said membrane means;

a plasma reservoir included in said conduit means and having a volume substantially larger than the remainder of said conduit means for collecting plasma;

a second pump means having the intake end connected to the downstream end of said plasma conduit means for applying reduced pressure to the filtrate face of said membrane means through said plasma reservoir for generating a positive pressure differential across said membrane means up to just below 50 mm Hg for forcing the plasma through the membrane;

a three-way valve;

a first line connected between the discharge end of said second pump means and said three way valve;

a second line connected to the outlet for said whole blood face of said membrane means and adapted to be connected to the patient;

a third line extending from said three-way valve and having a further bubble trap therein and having the end remote from said three-way valve connected to said second line downstream of said membrane means; and

a fourth line extending from said three way valve for discharging plasma therethrough;

whereby the path through which the plasma is circulated can be kept short so as to minimize the amount of heat of the blood coming from the patient which will be lost during flow of the blood and plasma through the apparatus and to minimize any adverse changes in the nature of the blood and plasma and the formation of undesirable side products due to the flow of the blood and plasma through the apparatus.

4,619,640

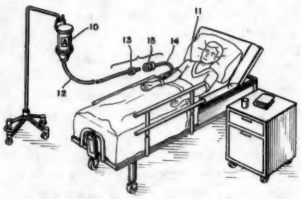
BLOOD TRANSFUSION CONNECTOR ASSEMBLY

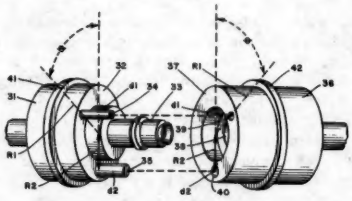
Abraham I. Potolsky, 1757 Glen Oaks Dr., Montecito, Calif. 93108, and Anton J. Blaser, 700 E. Mason St., Santa Barbara, Calif. 93103

Filed Aug. 17, 1984, Ser. No. 641,763

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—7 **16 Claims**





1. A connector assembly for use in assuring a proper blood type match when transfusing blood from a source to a patient, including:

(a) a plurality of first connectors each adapted to communicate with said source of different blood type and including a blood carrying projection of first given dimensions differing from said first given dimensions of the remaining ones of said first connectors;

(b) a plurality of second connectors each adapted to communicate with a vein in said patient and defining a blood receiving bore for communication with the patient's blood of different blood type and of second given dimensions differing from said second given dimensions of the remaining ones of said second connectors, said second given dimensions being complementary to said first given dimensions so that said first connectors are matably connectable each with only a respective one of said second connectors and only if the source and patient blood types associated with the first and second connectors match, any difference in said first and second dimensions preventing a proper connection from being carried out so that is is not possible to transfuse blood of one type into a patient having blood of another type; and

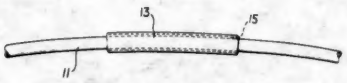
additional means on each of said first connectors and each of said second connectors for indicating a match between the source and the patient blood type and thereby further indicating that a proper connection can be made between said first and second connectors.

4,619,641

COAXIAL DOUBLE LUMEN ANTERIOVENOUS GRAFTS

Harry Schanzer, Larchmont, N.Y., assignor to Mount Sinai School of Medicine of The City University of New York, New York, N.Y.

Filed Nov. 13, 1984, Ser. No. 670,827
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—8 6 Claims



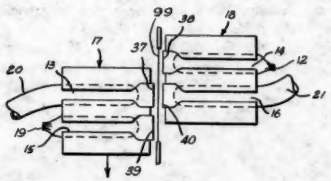
1. A filled coaxial double lumen tube for use as an implantable vascular graft in in vivo hemoaccess which comprises an outer tube positioned over an inner tube, both tubes being made of a material acceptable for use in implantable vascular grafts and having an internal and external diameter and a wall thickness, the outer tube having an internal diameter which is at least 1 mm larger than the external diameter of the inner tube creating a space between the outer tube and the inner tube and a self-sealing, nonbiodegradable, biocompatible polymer adhesive which evenly fills the space between the outer tube and the inner tube.

4,619,642

STERILE, COLD CUT CONNECTION PROCESS, APPARATUS AND SYSTEM

Dudley W. C. Spencer, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 12, 1985, Ser. No. 711,053
Int. Cl.[4] A61M 25/00, 1/00
U.S. Cl. 604—29 31 Claims



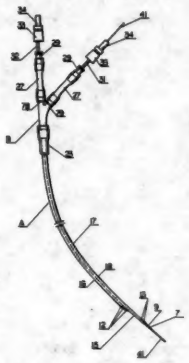
20. A sterile connection system for continuous ambulatory peritoneal dialysis in which a dialysis solution container with a transfer port that includes a segment of tubing is coupled to a tube extending from a patient's peritoneal cavity, wherein the improvement comprises a pair of mounting blocks adapted to receive, hold and flatten the transfer port tube and the patient's tube, cold-cutting means, means to provide movement between said blocks and said cutting means to a position such that the cutting means is between said blocks and traversing where the blocks are adapted to receive said tubes, means to realign said blocks to a position where the resulting different tube ends to be joined are aligned with and facing each other, means to separate the cutting means from the tubes that have been cut, means for heating the cut ends of the tubes, and means for urging together the tubes to be joined.

4,619,643

CATHETER

Chao-Liang Bai, 1294 Islington Ave., Apt. 404, Toronto, Ontario M9A 3K2, Canada

Filed Jun. 18, 1984, Ser. No. 621,482
Claims priority, application Canada, Jul. 25, 1983, 433088
Int. Cl.[4] A61M 5/00
U.S. Cl. 604—43 18 Claims



1. A double lumen catheter for gaining vascular access to the circulatory system of a living being, comprising,

an elongated integral plastic thin walled tubular body requiring support against buckling and kinking and having a proximal end part, a distal end part and an intermediate part,

the intermediate part having an outer wall and a septum wall providing juxtaposed arterial and venous lumens,

the proximal end part being a continuation of the intermediate part and diverging into, integrally connected branches each containing the continuation of a lumen for connection to access tubing leading to a hemodialysis apparatus,

the distal end part comprising a continuation of the outer wall tapering to a slender tip merging gradually and smoothly from said body and having an internal guidewire passage leading from the venous lumen and closure means terminating the arterial lumen, short of the tip, including a part of the outer wall tapering inwards to merge with the septum wall,

the outside surface of the outer wall being smooth and continuous to offer minimum frictional resistance to insertion into the body of a patient,

the inside walls of both lumens being smooth and continuous and the transition of the lumens between the said respective parts being smooth and uninterrupted to facilitate the insertion and removal of obturators into and from the respective lumens to extend from their proximal ends to their distal ends, and

the outer wall being provided with at least one blood access orifice in the distal end part of the arterial lumen and at least one blood access orifice in the distal end part of the venous lumen.

4,619,644

CLINICAL CATHETERIZATION TECHNIQUE AND APPARATUS FOR PERFORMING SAME

Van E. Scott, 31220 Wedgewood Dr., No. 201, Walled Lake, Mich. 48088

Filed Sep. 6, 1984, Ser. No. 647,930
Int. Cl.[4] A61M 25/00
U.S. Cl. 604—53 4 Claims

1. A catheterization techinque for use in rapid catheterization of a subject, said technique comprising the steps of:

(a) locating and preparing an insertion site;
(b) inserting into said site a needle having a shaft portion, a tip portion, and a base portion, said shaft portion being enclosed from proximate said base portion to proximate said tip portion within a hollow cylindrical introducer having a generally planar end adjacent said base portion and a lengthwise slit;
(c) pushing said needle and said introducer into said subject to a desired location;
(d) withdrawing said needle from said introducer;

(e) temporarily covering said planar end of said introducer to prevent the ingress of air;
(f) passing a guide wire having a catheter mounted thereon through said introducer into said subject;
(g) withdrawing said introducer from said location and said site;
(h) removing said introducer from said wire at said lengthwise slit;
(i) threading a catheter positioned about said wire into said subject to a desired location;
(j) withdrawing said wire from said catheter.

4,619,645

DISPOSABLE ENEMA UNIT

Richard P. Hussey, West Boxford, Mass., assignor to Aid-Pack, Inc., Gloucester, Mass.

Continuation of Ser. No. 579,183, Feb. 10, 1984, abandoned. This application Feb. 4, 1985, Ser. No. 678,875
Int. Cl.[4] A61M *3/00*
U.S. Cl. 604—111 **16 Claims**

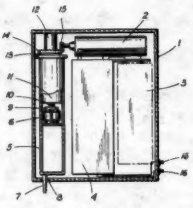
1. A disposable enema unit comprising:
a fluid receptacle adapted to be filled with sterile enema fluid;
a rectal tip having one end connected to said receptacle and a passage therethrough communicating with the interior of said bottle for allowing exit of fluid from said receptacle;
a break-off tab connected to the other end of said rectal tip, said break-off tab completely sealing said passage to prevent contamination of said fluid; and
a protective sleeve attached to said break-off tab covering said rectal tip when said break-off tab is attached to said rectal tip and coming away from said rectal tip when the break-off tab is removed.

4,619,646

DEVICE FOR THE DELIVERY-DOSING OF INJECTABLE PRODUCTS

Jesus A. Fernández-Tresguerres Hernandez, and Vincente M. de Garcini Guedas, both of Avda. de los Toreros, 73, 28028 Madrid, Spain

Filed Jan. 22, 1985, Ser. No. 693,060
Claims priority, application Spain, Jan. 25, 1984, 277.095
Int. Cl.[4] A61M *5/20*
U.S. Cl. 604—154 **3 Claims**



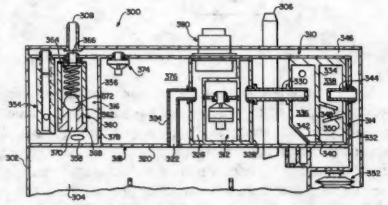
1. Device for the delivery-dosing of injectable products comprising a case having reduced dimensions in the interior of which an electromotor with its corresponding feed battery and an electronic programming device or Timer are disposed, the output shaft of the electromotor positioned orthogonally relative to the plunger of a syringe, the outlet tube of which passes through the walls of the case, the plunger at its posterior end fitting into two crossed slots of the head of a rod axially threaded to a cylindrical element located in the posterior zone of the tube of the syringe, which element projects through the nozzle of the syringe forming a portion having a smaller diameter, determining a stepping on which a friction clutch comprised of a bushing provided at its free end with a crown wheel, engages, which wheel constantly meshes with a pinion disposed in the output shaft of the electromotor, the electronic programming device also being provided with two manually operated controls mounted outside the case.

4,619,647

SURGICAL DRAINAGE APPARATUS

Leonard D. Kurtz, Woodmere, and Joseph M. LiCausi, Port Jefferson Station, both of N.Y., assignors to BioResearch Inc., Farmingdale, N.Y.

Division of Ser. No. 606,968, May 4, 1984. This application Aug. 15, 1985, Ser. No. 766,012
Int. Cl.[4] A61M *1/00*
U.S. Cl. 604—318 **5 Claims**



1. A suction control device for maintaining a relatively constant negative pressure in a collection chamber of a drainage apparatus over wide variations in applied suction, comprising:
a first passageway to the collection chamber and a second passageway to a source of suction,
a fine pressure adjusting means for finely adjusting the pres-

sure in said collection chamber including a first chamber and a resiliently biased fine one-way valve disposed in said first chamber so as to divide said first chamber into a vent side which is vented to atmosphere and a suction side which is fluidly connected to said first passageway to the collection chamber, said fine one-way valve permitting fluid flow only from said vent side to said suction side when the negative pressure in the collection chamber slightly exceeds a desired value;

a gross pressure adjusting means for grossly adjusting the pressure in said collection chamber including a second chamber and a resiliently biased gross one-way valve disposed in said second chamber so as to divide said second chamber into a vent side which is vented to atmosphere and a suction side which is fluidly connected to the said second passageway to a source of suction and downstream of said suction side of said first chamber, said gross one-way valve variably permitting a sufficient gross air flow from said vent side to said suction side of said second chamber to maintain the negative pressure in said suction side of said second chamber at a value slightly greater than the desired value for the collection chamber over a wide range of applied surfaces whereby this negative pressure is applied to said suction side of said first chamber where the negative pressure is slightly reduced to the desired value which is in turn applied to the collection chamber, and a third passage way interconnecting the suction sides of said first and second chambers whereby fluid flow passes from the collection chamber through said first passageway and said first chamber into said second chamber and to said source of suction throughuh the second passageway.

4,619,648

CONNECTION APPARATUS FOR SIDE CONNECTION TO FLUID COLLECTION BAG

Lucien M. Rath, Milwaukee, Wis., and William J. Dunn, Libertyville, Ill., assignors to The Kendall Company, Boston, Mass.

Filed Dec. 20, 1984, Ser. No. 683,993

Int. Cl.[4] A61M *1/00*

U.S. Cl. 604—326 **13 Claims**

1. Apparatus for connection of a fluid source to a flexible bag having front and back walls on opposite sides of a plane of symmetry of the bag, comprising:

a relatively rigid header attached to the flexible bag adjacent an inlet opening at the front of the bag;

a fluid conductive connector held in coupling engagement by said header and having an elongate portion for making fluid connection with the front of the flexible bag through the inlet opening thereof, said portion extending at an acute angle relative to the back of the bag when empty and making connection with the front of the bag at a location laterally offset from the plane of symmetry;

a female coupler attached to the front of the bag and having a coupler axis extending in a direction parallel to the back of the bag thereat;

said coupler having;

a first member extending at a right angle relative to the front of the bag, and

another portion in fluid communication with said first portion which extends in a direction transverse to that of the first portion;

said elongate portion holding the side of the bag adjacent the inlet opening at an angle extending away from the back wall.

4,619,649

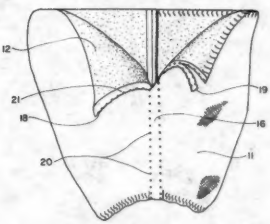
DISPOSABLE TODDLER TRAINING PANTY

Joan Roberts, 2337 Edgebrook Dr., Modesto, Calif. 96351

Filed Apr. 30, 1984, Ser. No. 605,641

Int. Cl.[4] A61F *13/16*

U.S. Cl. 604—396 **10 Claims**



1. A disposable toddler training panty, comprising a front panel having a non-permeable outer layer and a soft inner layer,

a rear panel having a non-permeable outer layer and a soft inner layer,

said front and rear panels being contiguous through a crotch area,

a thin absorbent pad interposed between said outer and said inner layers through said crotch area, and

separable side seams joining said front and rear panels along side edge portions thereof,

wherein said separable side seams further comprise, overlapping an edge portion of said front panel with a similar edge portion of said rear panel with only said outer layers in contact and bonding same, said same being provided with a plurality of perforations along the length thereof providing a means of seam separation by tearing same, and whereby separating both said side seams allows for easy removal of said toddler training panty from a toddler.

4,619,650

PLASMA BAGS

Leonard A. Wisdom, West Pymble, Australia, assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 9, 1985, Ser. No. 721,637

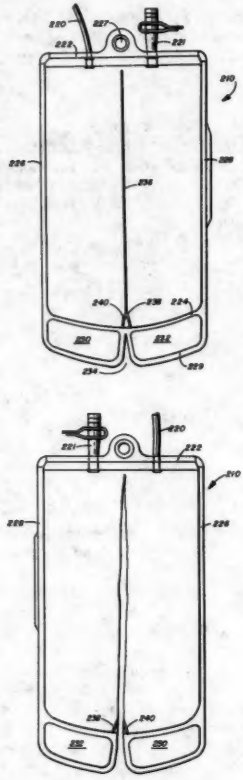
Claims priority, application United Kingdom, Jul. 13, 1984, 8417914

Int. Cl.[4] A61J *1/00*

U.S. Cl. 604—408 **10 Claims**

1. A plasma transfer bag of flexible sterilizable material, the bag having two side walls and being closed at the base, the bag having an extension to the base for gripping or holding the bag, the extension flap having a break therein extending to the base of the bag, the bag having a line of weakness in the walls extending from the break to the top of the bag, the bag on each side of the line of weakness being reinforced by means of a weld adjacent the base and extending no more than about 10% of the length of the line of weakness from the base of the bag,

the weld adapted to control tearing of the bag from the base to the top of the bag when opposing forces are applied to the



extension in a transverse direction parallel to the base of the bag to cause the bag to split and eject the contents.

4,619,651

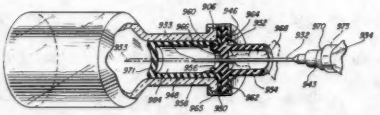
ANTI-AEROSOLING DRUG RECONSTITUTION DEVICE

Rudolph J. Kopfer, 1321 S. Eliseo Dr., Suite 1, Greenbrae, Calif. 94904, and Robert E. Smith, Smith Goggles, P.O. Box 2999, Ketchum, Id. 83340

Continuation-in-part of Ser. No. 600,504, Apr. 16, 1984. This application Aug. 27, 1984, Ser. No. 644,449

Int. Cl.[4] A61M *5/00*

U.S. Cl. 604—415 **20 Claims**



1. In combination: a vial having a mixing chamber and a neck for containing a fluid supply and an opening in the neck for gaining access to the mixing chamber;

an insert extendible through said opening and providing a sealed holding chamber at least partially within said neck; and

means for securing the insert to the vial to prevent separation therefrom and so that the insert seals the vial against the escape of fluid from the mixing chamber,

whereby the cannula of a syringe can be extended through the insert to establish fluid communication with the mixing chamber, and upon removing said cannula from the insert, aspirating fluid from the mixing chamber and from the syringe is substantially confined in the holding chamber to prevent exposure by the user to the fluid.

4,619,652

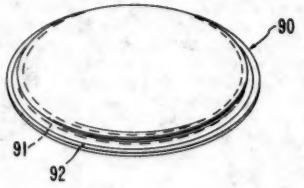
DOSAGE FORM FOR USE IN A BODY MOUNTED PUMP

James B. Eckenhoff, Los Altos; John R. Peery, Palo Alto, and Felix A. Landrau, Milpitas, all of Calif., assignors to ALZA Corporation, Palo Alto, Calif.

Division of Ser. No. 452,523, Dec. 23, 1982, Pat. No. 4,452,561. This application Aug. 19, 1985, Ser. No. 766,627

Int. Cl.[4] A61M *5/14*

U.S. Cl. 604—415 **3 Claims**



1. A container for a dosage of a biologically active agent in fluid form adapted to be received within the housing of a pump for delivery into the body of a patient comprising a closed, collapseible bag impermeable to the material comprising said dosage, said bag having a basal surface and a self-sealing welt extending circumferentially around said bag in a plane substantially parallel to and spaced apart from said basal surface.

4,619,653

APPARATUS FOR DETECTING AT LEAST ONE PREDETERMINED CONDITION AND PROVIDING AN INFORMATIONAL SIGNAL IN RESPONSE THERETO IN A MEDICATION INFUSION SYSTEM

Robert E. Fischell, Silver Spring, Md., assignor to The Johns Hopkins University, Baltimore, Md.

Continuation-in-part of Ser. No. 34,155, Apr. 27, 1979, Pat. No. 4,373,527. This application Nov. 4, 1982, Ser. No. 439,139

The portion of the term of this patent subsequent to Feb. 15, 2000, has been disclaimed.

Int. Cl.[4] A61M *7/00*

U.S. Cl. 604—891 **9 Claims**

1. An infusion system for providing medication to a living body of a patient comprising:

an infusion apparatus for implantation in said living body, including,

a medication reservoir for storing selected medication;

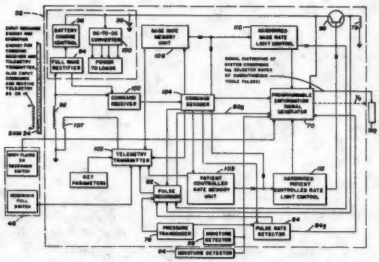
a pump means for infusing a fixed dosage of said medication into said living body with each pump actuation;

an infusion output from which doses of medication exit the infusion apparatus and are dispensed to the patient;

a control means for applying an electrical pulse to the pump means to delivery said fixed dosage of medication;

a means for detecting the presence of at least one predetermined condition regarding the operational state of the infusion apparatus, wherein said detecting means comprises a condition sensor, disposed at the infusion output, for sensing the dispensing of a dose of medication,

and, a comparing means for detecting when the number of medication dosages detected by said condition sensor deviates from the number of applied electrical pulses generated by said control means; and,



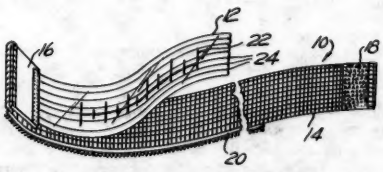
a means, operably coupled to said detecting means, for alerting said patient when said at least one predetermined condition is detected.

4,619,654

OINTMENT APPLICATOR

George Abplanalp, 1775 1E Florence Ave., Englewood, Fla. 33533

Continuation-in-part of Ser. No. 569,726, Jan. 10, 1984, abandoned. This application Jan. 4, 1985, Ser. No. 688,815
Int. Cl.[4] A61M 7/00
U.S. Cl. 604—897 6 Claims



1. A medication ointment applicator for applying a predetermined amount of medication ointment to a person's skin, said applicator comprising a band of flat plastic pliable film, a band of elastic material of a greater length than said band of plastic film, said band of plastic film being attached to said band of elastic material proximate an end of said band of elastic material, a scale longitudinally disposed substantially along the centerline of the band of plastic film provided with length graduations for measuring a length of ribbon of medication ointment applied to a surface of said plastic film for engagement with a person's skin, strip means disposed surrounding an open area of said plastic film provided with said scale for preventing excessive lateral and longitudinal spreading and seepage of said medication ointment when said applicator is applied to a person's skin, and fastening means at an end of said band of elastic material for attaching said end to a portion of said band of elastic material whereby said applicator is wound around a person's limb with said plastic film carrying said ointment in engagement with the skin of said person.

4,619,655

PLASTER OF PARIS AS A BIORESORBABLE SCAFFOLD IN IMPLANTS FOR BONE REPAIR

Jacob S. Hanker; Bill C. Terry; Wallace W. Ambrose, and Cecel R. Lupton, all of Chapel Hill, N.C., assignors to University of North Carolina, Chapel Hill, N.C.

Filed Jan. 26, 1984, Ser. No. 574,168
Int. Cl.[4] C09K 3/00
U.S. Cl. 623—1 18 Claims

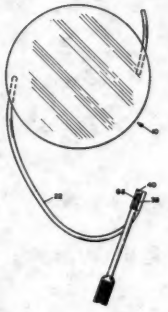
1. An animal implant comprising a scaffold material composed of Plaster of Paris and a non-bioresorbable calcium material bound within said Plaster of Paris.

4,619,656

INTRAOCULAR LENS

Richard L. Lindstrom, 1065 W. Ferndale Rd., Wayzata, Minn. 55391

Filed Jan. 10, 1984, Ser. No. 569,610
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 10 Claims



1. In combination, intraocular lens with a key-hole loop and a turn-key insertion instrument comprising:

a. intraocular lens including a lens optic at least one loop outwardly from said lens optic, and at least one non-circular key hole positioned in at least one of said loops; and

b. turn-key insertion instrument including a key having a corresponding geometrical relationship to said key-hole providing for key insertion of the intraocular lens into the eye.

4,619,657

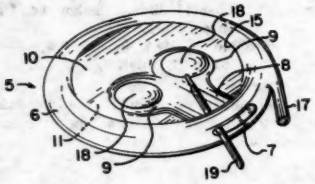
FLEXIBLE INTRAOCULAR LENS HOLDER

Richard H. Keates, 264 N. Drexel Ave., Columbus, Ohio 43209; Richard T. Schneider, 3550 NW. 33rd Pl., Gainesville, Fla. 32605; Timothy E. Roxey, 2222 NW. 36 Ter., Gainesville, Fla. 32605, and John D. Cox, 3416 SE. 29th Blvd., Gainesville, Fla. 32601

Continuation of Ser. No. 648,079, Sep. 7, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 814,080
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 29 Claims

1. An intraocular lens structure useful to position and secure a plurality of artificial lenses in the interior of a human eye and insertable through an incision in said eye, said lens structure

comprising a flexible lens holder incorporating means to affix said holder within the interior of the eye, and said lens holder



comprising means adapted to individually secure said lenses in a coplanar relationship adjacent to the irial opening of said eye.

4,619,658

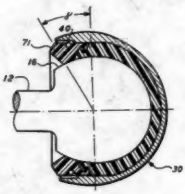
SPHERICAL KINEMATIC JOINT

Michael J. Pappas, 61 Gould Pl., Caldwell, N.J. 07006, and Frederick F. Buechel, 76 Crest Dr., South Orange, N.J. 07079

Division of Ser. No. 351,760, Feb. 24, 1982, abandoned. This application Oct. 1, 1984, Ser. No. 656,525

Int. Cl.[4] A61F 2/34

U.S. Cl. 623—22 11 Claims



1. An improved spherical joint prosthesis for providing three degrees of rotational movement between two bones, comprising:

a first component for engaging one of said two bones and providing internally a first seat;

a second component for engaging the other of said two bones and including a neck and a spherical head;

a bearing insert comprising a generally semi-hemispherically shaped primary bearing segment having a forward portion and a separate generally annularly shaped, radially split collar having a rearward portion, said primary bearing segment and said collar cooperatively providing internally a second seat having an opening for receiving said head; said forward and rearward portions provided respectively with complementarily shaped mating means, said mating means form said primary bearing segment and said collar into a sub-assembly whereupon engagement of said complementarily shaped mating means allows said collar to expand radially outwardly permitting said head to be inserted through said opening and once said head is received in said second seat said collar is able to contract radially inwardly without separation from said primary segment prior to and during assembly with said first and second component;

said bearing insert and said first component provided with cooperative retaining means for retaining said bearing insert within said first seat upon insertion of said bearing insert into said first component; and

upon said head being received within said second seat with said neck extending through said opening, said bearing insert for being received and retained within said first seat with said first component confining said head within said second seat whereby said rotational movement between said two bones is permitted, said bearing insert providing an overlap angle for preventing dislocation of said head from said bearing insert during said rotational movement.

4,619,659

HIP ENDOPROSTHESIS

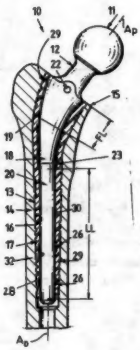
Ulrich Witzel, Wittener Str. 73d, D-5600 Wuppertal, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,519

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1983, 3334058

Int. Cl.[4] A61F 2/32

U.S. Cl. 623—23 12 Claims



1. A hip endoprosthesis for mounting in a distally tapering recess that opens at the proximal end of a femur, the prosthesis comprising:

a nonmetallic sheath imbedded in the recess so as to be generally integral with the femur and having an inner surface with a distally tapering proximal portion, a uniform-section distal portion, and an intermediate portion between the proximal and distal portions and generally of greater cross section than the distal portion;

a ball shaped to fit into an acetabulum;

a neck extending distally from this ball and out of engagement with the sheath and femur;

a stem unitarily formed of metal with the neck and ball and engaged in the sheath, the stem having an outer surface with a tapered proximal surface portion complementary to and tightly fitted in the proximal portion of the sheath surface and a uniform-section distal portion in the distal surface portion of the sheath surface, the stem substantially only engaging the sheath at its tapered proximal surface portion and its uniform-section distal portion, the intermedicate portion being spaced from and forming an annular compartment with the stem between the proximal and distal portions; and

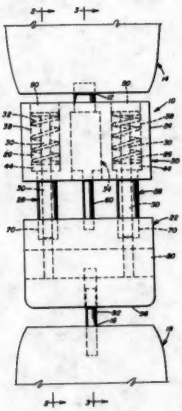
means between the distal portions of the inner and outer surfaces for relative sliding of the stem and the sheath at the distal portions, whereby relative motion of the proximal surface portions is impossible but relative sliding motion of the distal surface portions is possible.

4,619,660

COMPRESSIBLE ROTATIONAL ARTIFICIAL JOINT

Jean E. Christiansen, 15 Westwood Rd. South, Massapequa Park, N.Y. 11762; Maryanne Fitzgerald, 19 Brown Pl., Red Bank, N.J. 07701; Mitchell G. Moeller, 4938 Ten Mills Rd., Columbia, Md. 21044; Artemis Pascalides, P.O. Box 4488, Washington, D.C. 20017, and R. Thaddeus Vayda, 3051 Mimon Rd., Annapolis, Md. 21403

Filed Oct. 15, 1984, Ser. No. 661,105
Int. Cl.[4] A61F 2/64
U.S. Cl. 623—46 19 Claims



12. An artifical joint comprising:

a first housing;

a second housing;

rotating means in said second housing;

means mounting said first and second housings for movement of said first and second housings toward each other into a first position and away from each other into a second position, said movement being along a substantially linear path; and

means acting on said rotating means for limiting movement of said rotating means when said first and second housings are in said first position and for permitting movement of said rotating means when said first and second housings are in the second positon.

4,619,661

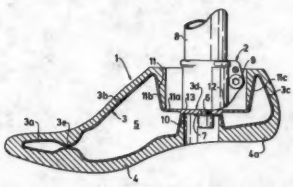
PROSTHESIS FOOT

Robert Axelsson, Hunnerydsvägen 92, S-561 46 Huskvarna, Sweden

PCT No. PCT/SE83/00070, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03050, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 3, 1983, Ser. No. 551,987
Claims priority, application Sweden, Mar. 5, 1982, 8201389
Int. Cl.[4] A61F 2/66
U.S. Cl. 623—55 11 Claims

1. An artificial foot comprising a flexible and elastic shell of unitary construction having a continuous hollow core, said shell having at least a mid-foot portion, a heel portion, and a recessed portion wherein said shell is formed with predetermined areas of elasticity so that articulation and resiliency of said foot resembles the heel strike, dorsal stop and toe rolling pattern of a natural foot during walking;

said recessed portion is spaced a distance from said sole portion and having a substantially planar bottom portion surrounded by side walls thereby forming substantially a blind bore;



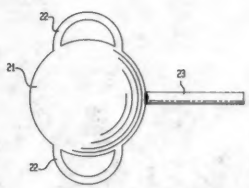
said foot being coupled to a lower leg means through a substantially rigid foot adapter, said adapter being directly connected to said foot in said recessed portion such that the foot adapter contacts said bottom portion without the mediation of any articulating elements such that the joint and supporting function which occur during walking are achieved by substantially direct contact between the foot adapter and recessed portion and the predetermined areas of elasticity of said shell.

4,619,662

INTRAOCULAR LENS

Albert M. Juergens, Jr., 45 Windsor Ct., Box 418, Norwood, N.J. 07648

Filed Apr. 19, 1985, Ser. No. 724,875
Int. Cl.[4] A61F 2/16
U.S. Cl. 623—6 1 Claim



1. Intraocular lens for an eye comprising a preformed molded mantle or lens having an accurately molded and polished exterior surface and a hollow interior of a first determined volume, said hollow interior being filled with a bio-compatible silicone elastomer having a predetermined volume equal to said first predetermined volume of the cavity whereby said lens assumes a predetermined refractory power.

4,619,663

PROCESS FOR THE BLEACHING OF TEXTILES AND STABILIZING COMPOSITION THEREFOR

Gerard Tatin, Mulhouse, France, assignor to Atochem, France

Filed Apr. 25, 1984, Ser. No. 603,708
Claims priority, application France, May 10, 1983, 83 07766
Int. Cl.[4] D06L *3/00*
U.S. Cl. 8—107 5 Claims

1. A process for the bleaching of cellulose-containing fibers or fabrics in a bleaching bath containing an oxidizing agent comprising adding to said bath a stabilizing composition consisting essentially of:

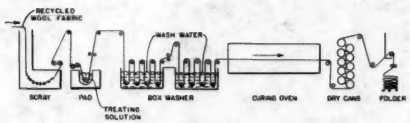
A metal chelating agent	1–2 g/l of bath
Sodium metalsilicate pentahydrate	0–8 g/l of bath
Sodium tetraborate decahydrate	5–10 g/l of bath
A soluble alkali phosphate	10–15 g/l of bath (calculated in weight of anhydrous product)
A non-ionic wetting agent	1–2 g/l of bath

4,619,664

METHOD OF IMPROVING THE ABRASION RESISTANCE OF RECYCLED WOOL

Randall R. Bresee, St. George, and Barbara M. Reagan, Manhattan, both of Kans., assignors to Kansas State University Research Foundation, Manhattan, Kans.

Filed Mar. 4, 1985, Ser. No. 707,890
Int. Cl.[4] D06M *3/02, 13/00*
U.S. Cl. 8—128 A 9 Claims



1. The method of improving the abrasion resistance of fabric composed of at least 50% by weight of recycled wool fibers, said recycled fibers containing fissures in their cuticle layers exposing interior protein, comprising:

(a) impregnating the fabric with an aqueous treating solution in the liquid phase including a bifunctional monomer selected from the group consisting of acrylic and methyacrylic type monomers, said monomer containing a vinyl group and a group capable of reacting with the free hydroxyl and/or amine groups of the exposed interior protein of wool fiber, said treating solution containing a polymerization initiator for said monomer and being adapted to promote reaction of the recycled wool with the monomers but being applied to said fabric at a temperature below its polymerization initiation temperature;

(b) washing said fabric with water at a temperature below said polymerization initiation temperature to remove said monomer from the exterior surfaces of the recycled wool fibers while leaving said monomer within said cuticle layer fissures of the recycled fibers; and

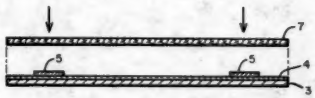
(c) curing said fabric by heating it at a temperature above the polymerization initiation temperature of said monomer.

4,619,665

SHEET CONTAINING HEAT TRANSFERABLE DYE AND SELECTIVE BLOCKING AGENT FOR HEAT TRANSFER PRINTING

Carl E. Sideman, Columbia; Thomas E. Lewis, Lexington, both of S.C., and Michael T. Nowak, Gardner, Mass., assignors to Technographics Printworld, Inc., Fitchburg, Mass.

Filed Mar. 11, 1985, Ser. No. 710,745
Int. Cl.[4] B41M *5/26*
U.S. Cl. 8—402 19 Claims



10. A method for heat transfer dye printing comprising (1) providing a transfer sheet comprising a substrate, at least one heat transferable dye being on one surfaces of the substrate which dye sublimes or vaporizes at a temperature in the range of from about 160° to 240° C., and a polyehtyleneimine blocking agent deposited on or below at least a portion of said at least one dye, said polyethyleneimine being chemically reactive with at least one of said heat transferable dyes; (2) placing said transfer sheet in contact with a material to be printed; and (3) heating said transfer sheet to a temperature and for a time sufficient to cause the heat transferable dye which is not in contact with the blocking agent to transfer to the surface of said material to be printed.

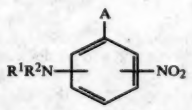
4,619,666

HAIR DYES CONTAINING AMINO-NITROBENZOIC ACID OR AMINO-NITROBENZENE SULFONIC ACIDS AS SUBSTANTIVE DYES

David Rose, Hilden; Edgar Lieske, Duesseldorf, and Norbert Maak, Neuss, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Jul. 8, 1985, Ser. No. 752,889
Claims priority, application Fed. Rep. of Germany, Jul. 7, 1984, 3425151
Int. Cl.[4] A61K *7/13;* C07C *101/52;* C07D *295/08*
U.S. Cl. 8—414 15 Claims

1. A hair coloring preparation containing at least one substantive hair dye compound selected from the group consisting of (1) compounds having the formula



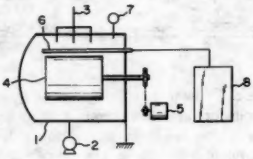
wherein A is an acidic group selected from the group consisting of —SO_3H and —COOH, R^1 and R^2 each are selected from the group consisting of hydrogen, C_1–C_4-alkyl, and —$(CH_2)_n$—X, where n is an integer from 2 to 4 and X is, a member selected from the group consisting of —OH and —NR^3R^4, where R^3 and R^4 each are selected from the group consisting of hydrogen, C_1–C_4-alkyl, C_2–C_4-hydroxyalkyl, and R^1 and R^2, together with the nitrogen are heterocycles selected from the group consisting of piperidino, pyrrolidino, piperazino and morpholino and (2) water-soluble salts thereof, in an amount sufficient to dye hair as a substantive hair dye.

4,619,667

METHOD FOR INCREASING COLOR DENSITY AND IMPROVING COLOR FASTNESS OF DYED FABRICS

Susumu Ueno; Hirokazu Nomura, both of Ibaraki; Shinobu Hashizume, and Toshiaki Nishide, both of Fukui, all of Japan, assignors to Shin-Etsu Chemical Co., Ltd, Tokyo; Emori & Co., Ltd and Nikka Chemical Ind. Co., Ltd, all of, Japan

Continuation-in-part of Ser. No. 557,667, Dec. 2, 1983, abandoned. This application Jun. 11, 1985, Ser. No. 743,506
Claims priority, application Japan, Feb. 12, 1982, 57-211692; Feb. 12, 1982, 57-211691
Int. Cl.[4] D06P 5/20
U.S. Cl. 8—444 4 Claims



1. A method for increasing the color density and color fastness of a dyed fabric material composed of at least 50% by weight of a synthetic fiber which comprises the steps of: (a) treating a dyed fabric material with an amino-modified organopolysiloxane or a dimethylpolysiloxane having a viscosity in the range from 10^2 to 10^8 centistokes at 25° C.; and (b) then exposing the dyed fabric material to low temperature plasma in an atmosphere of an inorganic gas under a pressure in the range from 0.01 Torr to 10 Torr.

4,619,668

DYED WRINKLE-RESISTANT AND DURABLE-PRESS COTTON FABRICS

John G. Frick, Jr., New Orleans, La.; Brian W. Jones, Raleigh, N.C.; Robbie L. Stone, Cary, N.C., and Michael D. Watson, Raleigh, N.C., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Sep. 11, 1985, Ser. No. 774,698
Int. Cl.[4] D06P 5/00
U.S. Cl. 8—496 9 Claims

1. A process for producing a dyed fabric composed entirely or in part of cellulose that has been rendered wrinkle-resistant and selfsmoothing comprising:

(a) treating a cellulosic fabric with a crosslinking agent selected from the group consisting of: an adduct from an amide and glyoxal, an acetal derived from a dialdehyde, and an aldehyde other than formaldehyde, and an acidic catalyst, said crosslinking agent and acid catalyst being of sufficient amounts and concentrations to impregnate and render said cellulosic fabric wrinkle-resistant and self-smoothing;

(b) and then drying and curing said fabric for sufficient time at sufficient temperatures to render said cellulosic fabric wrinkle-resistant and self-smoothing;

(c) subsequently dyeing the cured fabric.

4,619,669

METHOD FOR INCREASED MINE RECOVERY AND UPGRADING OF LIGNITE

Elvis E. Jones, Lake Jackson; Terry A. Pearce, Lake Jackson; Dacon C. Laird, III, Lake Jackson, and James H. Everitt, Fairfield, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 23, 1984, Ser. No. 674,382
Int. Cl.[4] C10L 9/00; B03B 5/60
U.S. Cl. 44—1 G 1 Claim

1. A process for upgrading lignite ores to remove a substantial proportion of the non-combustible ash content associated with the lignite which comprises:

(1) sizing by crushing to a maximum top size of less than about 6 inches in two directions (axis's)

(2) separating the clay and/or rock (gangue) which are discarded and lignite from each other in a float-sink gravity separator,

(3) directing the float containing the lignite and some small particles of clays to a screen deck to size the float into at least three portions,

(4) washing the first two screen proportions to free them of clays,

(5) collecting the third portion consisting of fines and water as an underflow from said deck,

(6) treating the underflow in a hydrocyclone to recover a substantial quantity of the lignite associated with some clays as the overflow and an aqueous stream containing the remainder of the clays and some lignite as the underflow and discarding.

(7) treating overflow to effectuate a size separation of the lignite substantially free of clays as underflow and the clays with some fine lignites as the overflow.

(9) seive bend dewatering and washing and drying the underflow and combining the resultant product with the +28 mesh lignite product,

(10) flocculating (clarifier-thickener) the refuse from the seive bend and the overflow from (7) to about 35% solids,

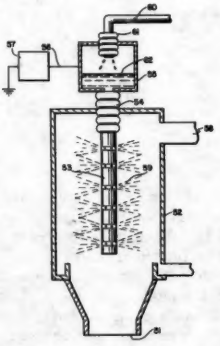
(11) further concentrating the refuse, as by filtration, to a discardable solid.

4,619,670

APPARATUS FOR DIELECTROPHORETICALLY ENHANCED PARTICLE COLLECTION

David H. Malcolm, 18 Deer Run Dr., Randolph, N.J. 07869, and George P. T. Wilenius, R. R. #1, Dunrobin, Ontario, Canada

Continuation-in-part of Ser. No. 605,399, Apr. 30, 1984, Pat. No. 4,541,844. This application Sep. 16, 1985, Ser. No. 776,760
Int. Cl.[4] B03C 3/16
U.S. Cl. 55—107 5 Claims



1. Apparatus for effecting dielectrophoretically enhanced separation of small sized particulates from a moving gas stream comprising

conduit means for confining said moving gas stream bearing said particulates,

a high potential electrode element disposed coaxially within said conduit means,

means for introducing a spray of selectively sized and charged liquid droplets of from 10 to 60 microns in diameter outwardly directed from said high potential electrode element into said gas stream in a path relative to the advance of said gas stream to maximize geometric interdic-

tion of said charged droplets and the particulates in said gas stream,

means associated with said spray introduction means for limiting the size of said introduced liquid droplets to 50 microns or less in diameter,

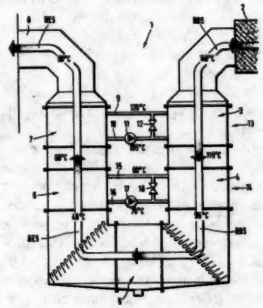
means for applying an electrical charge of greater than 10^{-3} coulombs per kilogram to said emitted spray Oroplets, such charge not being greater than 35 percent of the Rayleigh limit therefore and,

means for regulating the volume of liquid so introduced in droplet form to be in the order to about three ten thousandths that of the volume of gas being treated per unit time to minimize space charge degradation of the collecting environment with attendant maximization of dielectrophoretic attraction forces therewithin.

4,619,671
ENERGY TRANSFER DEVICE FOR DESULFURIZING INSTALLATION

Klemens Ruff, Bochum; Ludwig Suhr, Essen, and Paul Paikert, Witten, all of Fed. Rep. of Germany, assignors to GEA Luftkuehlergesellschaft Happel GmbH & Co, Bochum, Fed. Rep. of Germany

Filed May 29, 1985, Ser. No. 738,735
Int. Cl.[4] B01D *47/05, 53/14*
U.S. Cl. 55—222 15 Claims

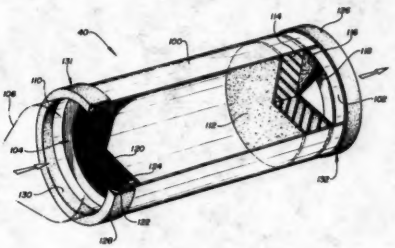


1. An energy transfer device for use in a desulfurizing installation including a first heat exchanger arranged in a stream of crude gas flowing through a scrubber, a second heat exchanger arranged in a stream of clean gas behind the scrubber, the first and second heat exchangers including heat exchange pipes and being interconnected by transfer conduits for a forcibly circulating heat carrying fluid, the heat exchange pipes and the transfer conduits being made of a pressure resistant metal material such as steel, the device comprising a third heat exchanger arranged in the stream of crude gas between the first heat exchanger and the scrubber, a fourth heat exchanger arranged in the stream of the clean gas between the scrubber and the second heat exchanger, said third and fourth heat exchangers operating at lower temperature levels than those of the first and second heat exchangers, said third heat exchanger including a plurality of heat exchanging hoses of a corrosion-resistant and adhesion inhibiting plastic material suspended in the stream of crude gas, said fourth heat exchanger including a plurality of heat exchanging hoses of a corrosion resistant and adhesion inhibiting plastic material suspended in the stream of clean gas, additional heat transfer conduits interconnecting the third and fourth heat exchangers to conduct a forcibly circulating heat carrying fluid, said additonal heat transfer conduits being made of at least corrosion-resistant plastic material, and all remaining parts of said third and fourth heat exchangers which contact the crude or clean gas stream being coated with a corrosion-resistant and adhesion inhibiting layer of plastic material.

4,619,672
FILTER FOR LASER SURGERY SMOKE EVACUATION SYSTEM

Philip D. Robertson, Colorado Springs, Colo., assignor to Xanar, Inc., Colorado Springs, Colo.

Filed Sep. 11, 1985, Ser. No. 774,694
Int. Cl.[4] B01D *50/00*
U.S. Cl. 55—316 4 Claims



1. A filter element for a laser surgery smoke evacuator system comprising:

a generally cylindrical hollow housing having an inlet end and an outlet end;

endcaps disposed about said inlet end and said outlet end and including a generally annular ring having a flange extending radially outwardly from an exterior edge of said ring and having a flange extending radially inwardly from an interior edge of said ring;

the outside diameter of said ring being slightly less than the inside diameter of said housing to provide a snug fit therein for both said endcaps;

a plurality of filter elements disposed within said housing and held in place by at least one of said endcaps;

inlet and outlet screens held in place respectively by said endcaps;

adhesive tape strips extending circumferentially about the inlet and outlet ends of said housing with said tape strips wrapping around said endcaps and covering the outer circumferential surface of said outwardly extending flange and the interior surface of the annular ring of each endcap and holding said inlet and outlet endcaps in place on said housing;

a high friction backing on said adhesive tape strips extending at least partially around the circumference of said strips; and

said high friction backing of said tape strips adapted to lightly hold said filter in place during use.

4,619,673
ADSORBENT DEVICE

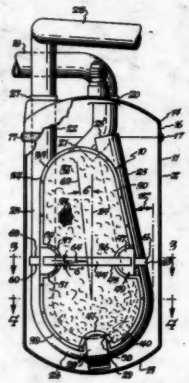
John S. Cullen, Buffalo; Samuel A. Incorvia, and James A. Vogt, both of Tonawanda, all of N.Y., assignors to Multiform Desiccants, Inc., Buffalo, N.Y.

Filed May 15, 1985, Ser. No. 734,171
Int. Cl.[4] B01D *53/04;* F23B *43/00*
U.S. Cl. 55—387 27 Claims

1. In a refrigerant receiver having a receiver axis and a pipe therein having first and second spaced pipe portions and a return bend connecting said first and second spaced pipe portions, an adsorbent device comprising a casing including first and second walls, adsorbent, means securing said first and second walls to each other to confine said adsorbent therebetween, spaced wall portions on said first wall in contiguous relationship with said first and second pipe portions, a first casing end portion on said casing proximate said return bend and a second casing end portion on said casing remote from said return bend, clip means operatively associated with said casing for securing said casing relative to said pipe portions, a

central clip portion on said clip means extending across said second wall in a direction transverse to said receiver axis and between said first and second casing end portions, and clip end portions on opposite ends of said central portion of said clip means for securing said clip means to said first and second pipe portions.

18. An adsorbent device comprising an elongated casing having a longitudinal axis and first and second walls, adsor-



bent, means securing said first and second walls to each other with said adsorbent therebetween, first and second casing end portions on said casing, clip means operatively associated with said casing for securing said casing to a foreign object, a central clip portion on said clip means, said central clip portion extending aross said casing transversely to said longitudinal axis and between said first and second casing end portions, and clip end portions on opposite ends of said central clip portion for securing said clip means to said foreign object.

4,619,674

DUAL-ELEMENT FILTER CARTRIDGE FOR AIR INTAKE FILTERS DESIGNED FOR A DUSTY ENVIRONMENT

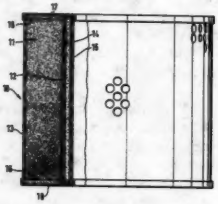
Hans Erdmannsdörfer, Ludwigsburg, Fed. Rep. of Germany, assignor to Filterwerk Mann & Hummel GmbH, Ludwigsburg, Fed. Rep. of Germany

Filed Sep. 13, 1985, Ser. No. 775,881

Claims priority, application Fed. Rep. of Germany, Sep. 13, 1984, 3433622

Int. Cl.[4] B01D *46/52*

U.S. Cl. 55—486 **7 Claims**



1. A disposable filter cartridge for air intake filters of internal combustion engines and other air aspirating machines operating in a dusty environment, the filter cartridge being of the annular type which is traversed by the air in a radially inwardly converging direction, the filter cartridge comprising in combination:

a first filter element in the shape of a first hollow cylindrical body formed of pleated filtering paper, the pleats of the filtering paper of the first filter element extending parallel and longitudinally with respect to the axis of said first hollow cylindrical body, so as to define concentric inner and outer peripheries of the first filter element;

a second filter element in the shape of a second hollow cylindrical body formed of pleated filtering paper, the pleats of the filtering paper of the second filter element extending parallel and longitudinally with respect to the axis of said second hollow cylindrical body, so as to define concentric inner and outer peripheries of the second filter element, the first and second filter elements having substantially the same axial length, and the second filter element being arranged concentrically inside the first filter element in such a way that the axes of the hollow cylindrical bodies of the two filter elements coincide to define a cartridge axis and the axial extremities of said two filter elements are substantially in radial alignment with each other; and

two disc-shaped end members engaging the axial extremities of the first and second filter elements, so as to position said two filter elements in relation to each other and to form impermeable axial end walls for said two filter elements; and wherein;

the filtering papers of said first and second filter elements are constituted of substantially the same fibers;

the density of the filtering paper of the second filter element does not exceed the density of the filtering paper of the first filter element;

the gauge of the filtering paper of the second filter element is not less than the gauge of the filtering paper of the first filter element; and

the effective surface of the second filter element is equal to between 8 and 24% of the effective surface of the first filter element, so that the incoming air, flowing through the first and second filter elements in succession, traverses the filtering paper of the first filter element at a speed which is between 8 and 24% of the speed at which it traverses the filtering paper of the second filter element, as a result of which air-entrained particles which, in the new state of the filter cartridge, pass through the first filter element are trapped by the second filter element.

4,619,675

FILTER FOR AIR CLEANERS

Moritsuna Watanabe, Tokyo, Japan, assignor to Midori Anzen Co., Ltd., Tokyo, Japan

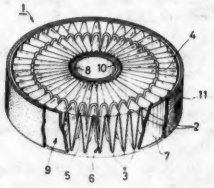
PCT No. PCT/JP84/00326, § 371 Date Feb. 12, 1985, § 102(e) Date Feb. 12, 1985, PCT Pub. No. WO85/00116, PCT Pub. Date Jan. 17, 1985

PCT Filed Jun. 22, 1984, Ser. No. 705,332

Claims priority, application Japan, Jun. 24, 1983, 58-96720

Int. Cl.[4] B01D *27/06*

U.S. Cl. 55—498 **3 Claims**



1. A filter for air cleaners, comprising a filter medium obtained by folding a piece of elongated filter paper so that ridges and valleys are formed alternately, fitting spacers only onto a

portion of said folded filter paper which does not include the edges of the folded filter paper so as to maintain the distances between the adjacent ridges and valleys properly, and then bending the resultant product to form a circular body with inner and outer circumferential surfaces and with the ridges and valleys extending in the radial direction, a filter body having inlet and outlet ports and circular inner and outer circumferential walls, said filter medium being set in said filter body between said inner and outer circumferential walls, a cushion material inserted between the inner circumferential surface of said filter medium and the inner wall of said filter body, and a cushion material bonded to the outer wall and inserted between the outer circumferential wall of said filter medium and the outer wall of said filter body, a prefilter member covering said air inlet port and an after-filter member covering said outlet port.

4,619,676

FILTER CARTRIDGE FOR FILTERING APPARATUSES

Ernst Turck, Peter-Parler-Str. 44, 8264 Waldkraiburg, Fed. Rep. of Germany

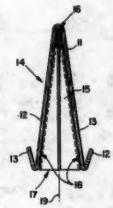
PCT No. PCT/DE84/00075, § 371 Date Nov. 27, 1984, § 102(e) Date Nov. 27, 1984, PCT Pub. No. WO84/03842, PCT Pub. Date Oct. 11, 1984

PCT Filed Mar. 28, 1984, Ser. No. 678,282

Claims priority, application Fed. Rep. of Germany, Mar. 31, 1983, 3311863

Int. Cl.[4] B01D *46/12*

U.S. Cl. 55—500 **5 Claims**



1. A filter cartridge for filtering apparatuses for removing impurities from hot and/or highly pressurized flowing gases, with zig-zag formed, gas-penetrated filter material folded at acute angles, whose part surfaces caused by the folding, between the fold lines, are arranged in relatively close juxtaposition to each other, characterized in that: one thin-walled strip **15** is disposed and arranged in the spaces between each two adjacent part surfaces **12, 13** of the filter material **11**, said thin-walled strip **15** having one straight-formed edge **16** lying in the inside of the fold **14** and one opposite lying zig-zag formed edge **17**, and in that, relative to the medial plane **19** of said thin-walled strip **15**, the bend or crest lines **18** rise steadily from said one straight formed edge **16** toward said zig-zag formed edge.

4,619,677

DISPOSABLE AIR FILTER ASSEMBLY AND METHOD OF MAKING SAME

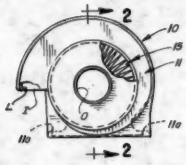
Charles L. Matheson; Preston D. Lane; James V. Dieringer, all of Cookeville, Tenn., and Emilio Ambafz, New York, N.Y., assignors to Cummins Engine Company, Inc., Columbus, Ind.

Filed Dec. 13, 1985, Ser. No. 808,877

Int. Cl.[4] BQ1D *35/30*

U.S. Cl. 55—510 **8 Claims**

1. An air filter assembly for use with an internal combustion engine comprising a housing having opposed end walls and an outer wall coacting to form an interior air flow passageway, an inlet for said passageway formed on the exterior of said housing and an outlet for said passageway formed in one of said end walls for communicating with an engine manifold; and a filter member disposed within said passageway and enclosed within said housing; said end and outer walls being initially of unitary construction, one end wall having a predetermined section thereof subsequently severed from said housing so as to expose at least a portion of said interior passageway whereby said filter member is inserted into said passageway; when severing



the said one end wall section from said housing, an annular segment of the housing is removed whereby a collar is formed on the exterior of the remainder of the housing and a peripheral flange is formed on the severed end wall section; the flange is sized to snugly fit within the collar when the severed end wall section is re-attached to the remainder of housing subsequent to the filter member being disposed within the passageway.

4,619,678

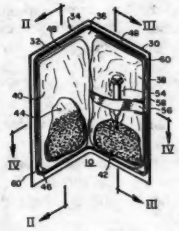
APPARATUS AND METHOD FOR TRANSPORTING AND PRESERVING PERISHABLE TEST SAMPLES

Howard Rubin, 1937 Nester St., Philadelphia, Pa. 19115

Continuation of Ser. No. 563,560, Dec. 20, 1983, abandoned, which is a continuation of Ser. No. 375,018, May 5, 1983, abandoned. This application Jul. 12, 1985, Ser. No. 754,615

Int. Cl.[4] F25D *5/00*

U.S. Cl. 62—4 **14 Claims**



1. An apparatus for transporting and preserving a perishable test sample, comprising:

a pair of substantially flat leaf members foldably connected to one another;

a first membrane sealed about its perimeter to at least one of the leaf members, extending over a substantial portion thereof and forming a first reservoir;

a latent refrigerating means disposed in the reservoir;

means for positively positioning and securing the test sample in a position flush with the first membrane and therefore the first reservoir, when the apparatus is open, and thereafter, when the apparatus is closed; and,

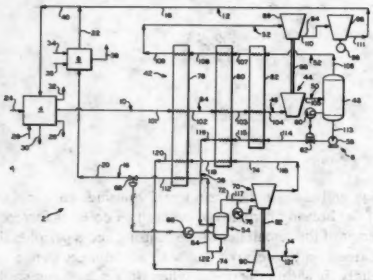
means independent of the positioning means for releasably holding the leaf members together to substantially close the entire perimeter of the apparatus and to thereby surround and cushion the test sample in heat exchanging relationship with the first reservoir, whereby upon activation of the latent refrigerating means, the test sample may be safely enclosed for transportation while preserved in a chilled environment.

4,619,679

GAS PROCESSING

Bradley W. DeLong, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 29, 1984, Ser. No. 666,068
Int. Cl.[4] F25J 3/00
U.S. Cl. 62—11 11 Claims



1. A process comprising:

providing a dry, relatively low purity hydrogen gas first stream;

cooling said first stream by indirect heat exchange to form a first cooled stream;

cooling said first cooled stream by expansion to form a first cooled expanded stream;

dividing said first cooled expanded stream into a gaseous second stream comprising a higher concentration of molecular hydrogen than the first stream and a liquid third stream comprising a lower concentration of molecular hydrogen than the first stream, said expansion supplying a first portion of the cooling required to divide the first stream into the second stream and the third stream;

passing the gaseous second stream into indirect heat exchange relationship with the first stream to provide a second portion of the cooling required to divide said first stream into said gaseous second stream and said liquid third stream, thus heating the gaseous second stream and forming a second heated stream;

passing said liquid third stream into indirect heat exchange relationship with said first stream to provide a third portion of the cooling required to divide said first stream into said gaseous second stream and said liquid third stream, thus heating the liquid third stream and forming a third heated stream;

dividing said third heated stream into a gaseous fourth stream and a liquid fifth stream;

cooling the gaseous fourth stream by expansion to form a fourth cooled stream;

passing the fourth cooled stream into indirect heat exchange relationship with the first stream to provide a fourth portion of the cooling required to divide said first stream into said gaseous second stream and said liquid third stream; and

passing the liquid fifth stream into indirect heat exchange relationship with the first stream to provide a fifth portion of the cooling required to separate said first stream into said gaseous second stream and said liquid third stream.

9. Apparatus comprising:

a. a means for passing fluids in indirect heat exchange relationship;

b. a first expander means for reducing the pressure on a fluid;

c. a first conduit means connecting the means for passing fluids in indirect heat exchange relationship with the first expander means;

d. a first vessel to provide for the phase separation of a liquid and a gas;

e. a second conduit means connecting the first expander means with the first vessel;

f. a third conduit means connecting an upper portion of the first vessel with the means for passing fluids in indirect heat exchange relationship;

g. a second vessel for phase separating a liquid and a gas;

h. a fourth conduit means connecting a lower portion of the first vessel with the second vessel, said third conduit means passing through the means for passing fluids in indirect heat exchange relationship;

i. a fifth conduit means connected to a lower portion of the second vessel, said fifth conduit means passing through a portion of the means for passing fluids in indirect heat exchange relationship;

j. a second expander means for reducing the pressure on a fluid;

k. a sixth conduit means connecting an upper portion of the second vessel with the second expander; and

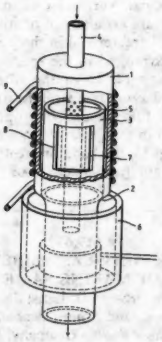
l. a seventh conduit means connected to the second expander, said seventh conduit means passing through a portion of the means for passing fluids in indirect heat exchange relationship.

4,619,680

MANUFACTURE OF INTEGRATED OPTICAL WAVEGUIDES

Noorallah Nourshargh, London, and John S. McCormack, Middlesex, both of England, assignors to The General Electric Co. p.l.c., England

Filed Jun. 7, 1985, Ser. No. 742,207
Claims priority, application United Kingdom, Jun. 11, 1984, 8414878
Int. Cl.[4] C03B 37/027
U.S. Cl. 65—3.12 12 Claims



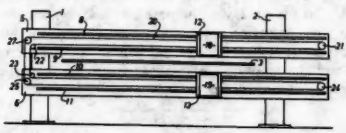
1. A method of manufacturing an integrated optical waveguide in which the waveguide is composed of glass deposited in a first layer on a substrate by a chemical vapour deposition process wherein a chemical reaction for effecting the deposition process is initiated by means of a plasma produced in a reaction zone by a microwave cavity and supplied with power from a microwave generator.

4,619,681

METHOD AND APPARATUS FOR MEASUREMENT OF STRESS IN FLOAT GLASS

Roger Tetaz, Beauchamp, and Philippe Vizet, Bourg La Reine, both of France, assignors to Saint-Gobain Recherche, Aubervilliers Cedex, France

Filed Apr. 17, 1985, Ser. No. 724,149
Claims priority, application France, Apr. 16, 1984, 84 06182
Int. Cl.[4] C03B *17/06*; G01B *11/18*
U.S. Cl. 65—29 13 Claims



1. Apparatus for measuring permanent longitudinal stresses in a float glass sheet during location of the sheet along a production line, said apparatus comprising a mechanical unit, means for supporting said mechanical unit over said sheet and driving the same in translation crosswise of said sheet, means for measurement continuously of any double refraction in the sheet according to one of the Friedel and Senarmont methods, said measurement means including a first light source, a first polarizer for polarizing a beam of light from said light source, means for transforming said polarized beam to a circular beam, a second polarizer, a first photosensitive receiver for transforming a sensed intensity of light beam to an electric signal, each of said light source, first and second polarizer, transforming means and first photosensitive receiver located along a linear optical path and one of said polarizers being driven in a continuous rotational movement, means for measuring the temperature of said sheet at a location within said sheet coincident with the point of measurement and at the time of mesurment of any double refraction, means for recording and processing said measurements of stresses and temperature calculating the permanent longitudinal stresses, and means mounting said measurement means on said mechanical unit.

6. A process for measuring permanent longitudinal stress in a float glass sheet along a production line, directing a beam of polarizing light toward a location within said sheet, responding to the intensity of said beam of light which shall pass through said sheet and any variation in intensity indicative of stresses which create a double refraction, transducing said response to a signal representative at any time to the quality of the sheet measured, continuously moving said beam of polarizing light across the width of said sheet to measure stresses at adjacent locations, simultaneously measuring the temperature at each said location across the width of said sheet to which said polarizing light is directed for measuring stresses, and combining said signal and response to temperature measurement from each location to provide a value of permanent stresses throughout the entire width of said sheet.

4,619,682

METHOD FOR OPERATOR-CONTROLLED MOLTEN GLASS LUMP PROCESSING

Franz Günthner, Mainz-Lerchenberg, Fed. Rep. of Germany, assignor to Schott Glaswerke, Fed. Rep. of Germany

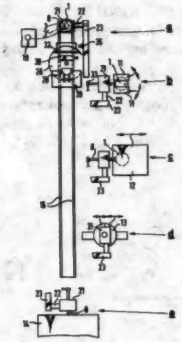
Filed May 21, 1985, Ser. No. 736,235
Claims priority, application Fed. Rep. of Germany, May 25, 1984, 3419608
Int. Cl.[4] C03B *9/03*
U.S. Cl. 65—64 3 Claims

1. A method for processing molten glass lumps using an operator-controlled manipulator having a holder comprising the steps of:

moving said glass lump from a first position to a preliminary blowing station engageable with said holder and preliminarily blowing said lump on said holder with said manipulator;

moving the holder with the preliminarily blown glass lump thereon by said manipulator to a marving station and marving said glass lump;

moving the holder with the marved glass lump thereon by said manipulator to a heating station and heating said glass lump;



moving the holder with the heated glass lump thereon by said manipulator to a forming station and forming said glass lump;

moving the holder with the formed glass lump thereon by said manipulator to a cooling lehr; and

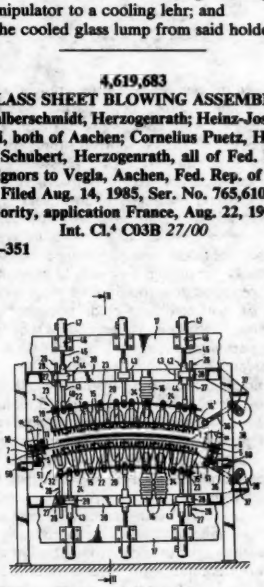
severing the cooled glass lump from said holder.

4,619,683

GLASS SHEET BLOWING ASSEMBLY

Friedrich Halberschmidt, Herzogenrath; Heinz-Josef Reinmold; Josef Audi, both of Aachen; Cornelius Puetz, Hueckelhoven, and Gerd Schubert, Herzogenrath, all of Fed. Rep. of Germany, assignors to Vegla, Aachen, Fed. Rep. of Germany

Filed Aug. 14, 1985, Ser. No. 765,610
Claims priority, application France, Aug. 22, 1984, 84 13068
Int. Cl.[4] C03B *27/00*
U.S. Cl. 65—351 12 Claims



1. A glass blowing device including two mutually facing blowers having a plurality of tubular bodies placed side-by-side and nozzles directed toward shaped glass sheets placed between said blowers along a blowing surface,

said tubular bodies being adjustably mounted so as to adapt to the particular shape of said sheets;

deformable guide rails positioned perpendicularly to said tubular bodies for supporting said tubular bodies of each

of said blowers in various positions along the entire width of said blowing surface;

at least one adjustable fastener for deforming said guide rails to a desired shape;

and servomotor means programmed to effect correct positioning of said adjustable fastener.

4,619,684

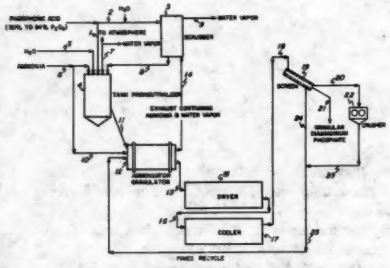
PRESSURE REACTOR FOR PRODUCING DIAMMONIUM PHOSPHATE

David G. Salladay, Decatur, and Frank P. Achorn, Killen, both of Ala., assignors to Tennessee Valley Authority, Muscle Shoals, Ala.

Continuation of Ser. No. 538,714, Oct. 3, 1983, now Defensive Publication No. T104,201. This application Mar. 24, 1986, Ser. No. 843,414

Int. Cl.[4] C05B *7/00*

U.S. Cl. 71—34 **7 Claims**



SHEET OF CONVENTIONAL PROCESS FOR PRODUCTION OF GRANULAR DIAMMONIUM PHOSPHATE

1. An improved process for preparing granular substantially dust free, diammonium phosphate of particle size distribution eminently suitable for bulk blending with other fertilizer values, which improved process comprises supplying a stream of ammonia to the reaction section of a pressure pipe reactor; simultaneously supplying a stream of partially ammoniated phosphoric acid to said reaction section of said pressure pipe reactor, said partially ammoniated phosphoric acid having a P_2O_5 content ranging from about 27 to about 31 percent by weight and a N:P mole ratio ranging from about 0.3 to about 0.8; simultaneously supplying a stream of wet-process merchant-grade phosphoric acid to said feed section of said pressure pipe reactor, said merchant-grade phosphoric acid containing from about 50 to about 54 percent P_2O_5 by weight, said streams of said partially ammoniated phosphoric acid and said merchant-grade phosphoric acid proportioned one to another to effect a blend thereof ranging from about 38 to about 42 percent P_2O_5 by weight, and contacting said ammonia introduced into said feed section of said pressure pipe reactor with said streams of phosphoric acid; maintaining in said pressure pipe reactor a temperature ranging from about 260° F. to about 340° F. and a pressure ranging from about 40 psig to about 80 psig; subsequently introducing the partial reaction product resulting from contacting said ammonia with said partially ammoniated phosphoric acid and said merchant-grade phosphoric acid into the vapor tube extension of said pressure type reactor to ensure continuous intimate contact therebetween; subsequently discharging from the downstream portion of said vapor tube extension through a discharge area comprising an exaggerated elongated aperture in the side wall thereof an amorphous diammonium phosphate material into the upper end of an inclined rotating drum and on to a bed of rolling discrete particles of diammonium phosphate maintained therein; subsequently withdrawing particulate diammonium phosphate material from the lower end of said inclined rotating drum and introducing same into sizing means; withdrawing from said sizing means granular particles within a predetermined size range and introducing same into cooling means; withdrawing from said cooling means as product the resulting cooled particles of diammonium phosphate of a preselected size range; withdrawing from said sizing means fines and crushed oversize particles of diammonium phosphate and returning same as recycle into the upper end of said inclined rotating drum, said improved process characterized by the fact that the combination of relatively high temperatures and pressures utilized therein effects a discharge area heat flux sufficient to (1) operate said process at a recycle ratio of 3:1, (2) yield a product DAP therefrom containing a moisture content of about 1 to about 2 weight percent, and (3) substantially eliminate from said process the requirement for the addition thereto of external heat energy subsequent to the step of removing said diammonium phosphate from the lower end of said inclined rotating drum.

4,619,685

PROCESS FOR CONTROLLING THE GROWTH OF SUCKERS ON A TOBACCO PLANT

Yasuo Kamuro, Urawa; Koichi Hirai, Hanyu; Fumio Suzuki; Susumu Yamamoto, both of Funabashi, and Noboru Shindo, Machida, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

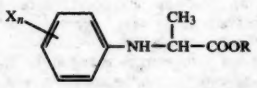
Filed Nov. 15, 1984, Ser. No. 671,689

Claims priority, application Japan, Nov. 18, 1983, 58-217166

Int. Cl.[4] A01N *37/44*

U.S. Cl. 71—78 **13 Claims**

1. A process for controlling the growth of suckers on a tobacco plant which comprises contacting the plant with a suckers controlling amount of a plant growth regulator comprising an N-substituted alanine derivative of the formula:



wherein X represents halogen atom or trifluoromethyl, R represents hydrogen, straight chain or branched chain alkyl having 1–4 carbon atoms, alkenyl having 2–4 carbon atoms, an alkali metal atom or amine-forming residue, and n is zero or an integer of 1 or 2, with the proviso that when n is 2, X may be the same or different.

4,619,686

PYRIDAZINYLUREA COMPOUNDS AND METHODS OF USE AS HERBICIDES

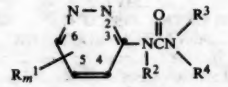
Riaz F. Abdulla, Greenfield, and Jack G. Samaritoni, Knightstown, both of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Jul. 17, 1984, Ser. No. 631,651

Int. Cl.[4] A01N *43/58*; G07D *237/20, 237/22*

U.S. Cl. 71—92 **16 Claims**

1. A compound of the formula



wherein

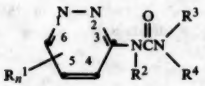
R_2 is hydrogen;

R_3 and R_4 are independently C_1–C_3 alkyl, C_1–C_3 alkoxy, C_2–C_4 alkenyl, hydroxy(C_1–C_4 alkyl) or (C_1–C_6 acyloxy)C_1–C_6 alkyl;

m is 1 or 2; and

when m is 1, R^1 represents 1,1dimethylethyl, and when m is 2, one R^1 represents 1,1-dimethylethyl and the other R^1 represents chloro.

6. A method of inhibiting the growth of unwanted vegetation which comprises contacting the vegetation or the soil in which the vegetation is growing with an effective amount of a compound of the formula



wherein

R_2 is hydrogen;

R_5 and R_6 are independpently hydrogen, C_1–C_3 alkyl, C_1–C_3 alkoxy, C_2–C_4 alkenyl, hydroxy (C_1–C_4 alkyl) or (C_1–C_6 acyloxy)C_1–C_6 alkyl;

n is 1 or 2; and

when n is 1, R^1 represents 1,1-dimethylethyl, and when n is 2, one R^1 represents 1,1-dimethylethyl and the other R^1 represents chloro.

4,619,687

TRIAZOLOPYRIDAZINES AND THEIR USE AS HERBICIDES

Toru Haga, Takarazuka; Eiki Nagano, Nishinomiya; Ryo Sato, and Kouichi Morita, both of Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

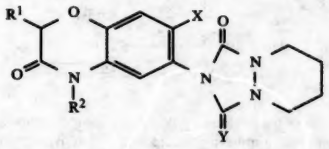
Filed Sep. 25, 1985, Ser. No. 779,865

Claims priority, application Japan, Sep. 27, 1984, 59-203785; Dec. 27, 1984, 59-279449

Int. Cl.[4] A01N *43/84;* C07D *498/04*

U.S. Cl. 71—92 **20 Claims**

1. A compound of the formula:



wherein R^1 is a hydrogen atom or a methyl group, R^2 is a C_1–C_5 alkyl group, a C_3–C_4 alkenyl group, a C_3–C_4 alkynyl group or a C_1–C_4 alkoxymethyl group, X is a hydrogen atom or a fluorine atom and Y is an oxygen atom or a sulfur atom.

14. A method for exterminating harmful weeds which comprises applying as an active ingredient a herbicidally effective amount of the compound according to claim 1 to the area where the weeds grow or will grow.

4,619,688

HERBICIDAL SULFONYLGUANIDINE DERIVATIVES

Kozo Shiokawa, Kawasaki; Koichi Moriya, Hachioji; Toshio Goto, Sagamihara; Atsumi Kamochi, Hino, and Shigeo Kohama, Hachioji, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

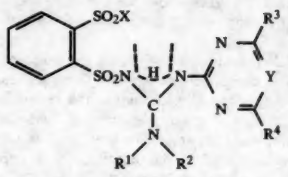
Filed Jan. 4, 1985, Ser. No. 688,844

Claims priority, application Japan, Jan. 10, 1984, 59-1257

Int. Cl.[4] C07D *239/34, 239/42, 413/12;* A01N *43/54*

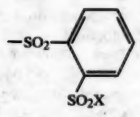
U.S. Cl. 71—92 **9 Claims**

1. A sulfonylguanidine derivative of the formula



in which

R^1 is a hydrogen atom or the group



R^2 is a hydroxy group, a lower alkoxy group or a di-lower alkylamino group,

R^3 and R^4 each independently is a lower alkyl group or a lower alkoxy group,

X is a lower alkoxy group, a lower alkylamino group or a morpholino group, and

Y is CH.

7. A herbicidal composition comprising a herbicidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,619,689

DIPHENYL ETHER DERIVATIVES AND HERBICIDES CONTAINING SAME

Takeo Yoshimoto; Akira Hosono; Joh Miki; Yasunobu Funakoshi; Takashi Fujita, and Yoshikata Hojo, all of Kanagawa, Japan, assignors to Mitsui Toatsu Chemicals, Inc., Tokyo, Japan

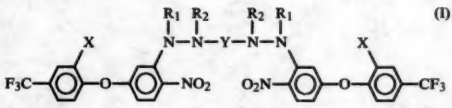
Division of Ser. No. 287,654, Jul. 28, 1981, Pat. No. 4,515,628, which is a continuation of Ser. No. 91,858, Nov. 6, 1979, abandoned. This application Oct. 12, 1984, Ser. No. 660,579

Claims priority, application Japan, Nov. 8, 1978, 53-136769

Int. Cl.[4] A01N *47/28, 37/18;* C07C *133/02, 109/10*

U.S. Cl. 71—119 **8 Claims**

1. A diphenyl ether compound represented by the general formula I,



(I)

wherein X is hydrogen or chlorine atom, R_1 and R_2 each stands for hydrogen or a lower alkyl group and Y is —CO—, —CO-CO— or —CO$(CH_2)_n$CO— wherein n is an integer of from 1 to 4.

4,619,690

CHROMITE ORE BENEFICIATION

Patrick R. Taylor, Moscow, Id., and Matthew A. Omofoma, Ile-Ife, Nigeria, assignors to Idaho Research Foundation, Inc., Moscow, Id.

Filed Feb. 6, 1984, Ser. No. 577,531

Int. Cl.[4] C01G *37/00;* C22B *1/00*

U.S. Cl. 75—1 R **13 Claims**

1. A process for beneficiating chromite ores, comprising:

reacting chromite ore with at least one sulfur oxide selected from the group consisting of sulfur dioxide and sulfur

trioxide and oxygen by passing a gaseous stream including a sulfur oxide and oxygen about the chromite ore at temperatures in the range of approximately 300°–1000° C. or higher; and

leaching reacted chromite ore by placing the reacted ore in a leach solution comprising an aqueous ferric sulfate solution having a concentration thereof in the range greater than approximately 5 grams per liter of solution; and having a pH of less than approximately +4.0 as adjusted by adding sulfuric acid to the solution, for a sufficient period of time to allow soluble constituents of the ore to be dissolved into the leach solution to thereby improve the chromium to iron ratio and the concentration of chromium in the residual ore.

13. A process for removing sulfur oxides from waste gas streams containing oxygen and sulfur oxides, and for simultaneously beneficiating chromite ores, comprising:

passing a gas stream containing at least one sulfur oxide selected from the group consisting of sulfur dioxide and sulfur trioxide, and oxygen over prepared chromite ore at temperatures in the range of approximately 300° C.–1000° C. or higher to react the chromite with the sulfur oxides and oxygen thereby removing portions of the sulfur oxides from the gas stream and reacting the chromite ore therewith; and

leaching chromite ore reacted with the sulfur oxide and oxygen containing gas stream, using an aqueous ferric sulfate solution having a concentration thereof in the range greater than approximately 5 grams per liter of solution and having a pH of less than approximately +4.0 to thereby solubilize compounds formed during passage of the sulfur oxide and oxygen containing gas stream over the prepared chromite ore, and thus beneficiate the residual chromite.

4,619,691

METHOD OF MANUFACTURING ULTRA-FINE PARTICLES

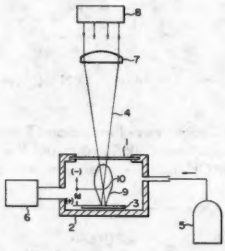
Takeshi Araya, Higashikurume; Akira Matsunawa, Nishinomiya; Seiji Katayama, Suita; Susumu Hioki, Kashiwa; Yoshiro Ibaraki, and Yoshishige Endo, both of Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 5, 1985, Ser. No. 795,083

Claims priority, application Japan, Sep. 2, 1985, 60-191901

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—0.5 B 18 Claims



1. A method of producing ultra-fine particles comprising the steps of:

irradiating a laser beam on a surface of a material;

generating a plume including ultra-fine particles by the irradiation of the material with the laser beam, said generating a plume being achieved by performing said irradiating at a suitable level; and

collecting said particles.

4,619,692

PROCESS FOR THE PRODUCTION OF METALLIC SEMI-FINISHED PRODUCTS

Johannes Jachowski, Duisburg, and Paul Pant, Essen, both of Fed. Rep. of Germany, assignors to Fried Krupp GmbH, Fed. Rep. of Germany

Filed Jul. 15, 1985, Ser. No. 755,132

Claims priority, application Fed. Rep. of Germany, Jul. 14, 1984, 3426086

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—10.25 11 Claims

1. Process for the production of a metallic semi-finished product which contains at least one alloy and which has at least two zones with different nitrogen content, comprising remelting an electrode, by pressure electroslag remelting, wherein the remelting occurs in at least two steps, in each of which differing amounts of nitrogen in the form of solid nitrogen donators are added to the melt, and wherein the pressure produced by a nitrogen- or noble gas-atmosphere is changed from remelting step to remelting step in a range of 5 to 50 bar.

4,619,693

SYSTEM USING ELECTRIC FURNACE EXHAUST GAS TO PREHEAT SCRAP FOR STEELMAKING

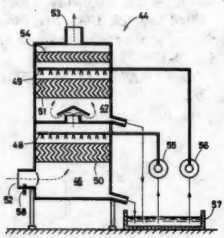
Kiyoshi Takai, and Kiyoshi Iwasaki, both of Hyogo, Japan, assignors to Godo Steel, Ltd., Osaka, Japan

Filed Apr. 9, 1985, Ser. No. 721,461

Claims priority, application Japan, Jul. 23, 1984, 59-152300

Int. Cl.[4] C22B *4/00*

U.S. Cl. 266—88 8 Claims



1. A system for preheating of contaminated scrap to be used in steelmaking, employing exclusively heat from exhaust gas flow carrying dust and unburned combustibles from a furnace, said system comprising:

combustion means for burning said combustibles present in said exhaust gas flow, said combustion means being shaped for separating out a portion of dust particles from said exhaust gas flow contemporaneously with said burning of said combustibles;

scrap preheating means for preheating scrap to be charged into said electric furnace by transfer thereto of heat energy from a predetermined portion of said exhaust gas flow conveyed from said combustion means;

dust collector means for collecting dust from said exhaust gas flow after preheating of scrap in said scrap preheating means;

gas scrubber means for scrubbing malodorous substances generated by said containmants in preheating of said scrap from said gas exhaust flow, wherein said exhaust gas flow is scrubbed with a flow of an aqueous solution of deodorant solvent;

means for detecting the temperature of said exhaust gas flow at the inlet of said gas scrubber means;

means for adjusting the flow rate of said solvent flow in response to said detected exhaust gas flow temperature so as to generate saturated water vapor from said solvent flow to reduce the temperature of said exhaust gas flow flowing through said scrubber means; and

wet-type electric precipitator means for collecting residual dust particles and contaminants attached to said saturated water vapor and liquid droplets in said exhaust gas flow.

4,619,694

METHOD OF REFINING STEEL AND APPARATUS

Yasutaka Kawanobe; Hisao Noguti, both of Gunma; Singi Kanou, Shinto, and Katsuya Yamazaki, Aichi, all of Japan, assignors to Daido Tokusyuko K.K., Nagoya and Yahagi Engineering K.K., Aichi, both of, Japan

Filed Aug. 5, 1983, Ser. No. 520,727

Claims priority, application Japan, Aug. 5, 1982, 57-136532

Int. Cl.[4] C21C *5/30*

U.S. Cl. 75—59.14 10 Claims

1. A method of adjusting the carbon content of molten steel to a desired carbon content, which comprises:

determining the carbon content in the molten steel by measuring a change of the heat taken away per unit time in cooling water heat exchanged with exhaust gas removed from the molten metal, according to the following formula:

$$C = \frac{Cp \cdot W}{\beta K \frac{W}{100} (\Delta Hco + \alpha \Delta Hco_2)} \cdot \Delta t$$

wherein C is the carbon content of the molten steel, Cp is specific heat of water (K cal/kg. °C.), W is weight of molten steel (kg), β is a carbon diffusion-rate constant, K is a coefficient of heat transfer for the cooling water, ΔHco is heat generated by reaction $C \rightarrow CO$ (K cal/kg. °C.), ΔHco_2 is heat generated by reaction $CO \rightarrow CO_2$ (Kcal/kg. °C.), α is conversion rate of $CO \rightarrow CO_2$, and Δt is the difference in temperature of the cooling water after and before being heat exchanged; and

blowing oxygen into the molten steel in an amount to yield the desired carbon content.

4,619,695

PROCESS FOR PRODUCING HIGH-PURITY METAL TARGETS FOR LSI ELECTRODES

Hideo Oikawa; Takao Amazawa, both of Atsugi; Nakahachiro Honma, Musashino; Hideo Miyazaki; Iwao Kyono, both of Toda; Nobuyuki Mori, Tokyo; Yoshiharu Katoh, and Masami Kuroki, both of Toda, all of Japan, assignors to Nihon Kogyo Kabushiki Kaisha and Nippon Telegraph & Telephone Public Corporation, both of Tokyo, Japan

Filed Jul. 26, 1984, Ser. No. 634,895

Claims priority, application Japan, Sep. 22, 1983, 58-174164

Int. Cl.[4] C22B *4/00*

U.S. Cl. 75—65 EB 4 Claims

1. A process for producing a high-purity metal target for the formation of LSI electrodes, in which the target has an alkali metal content of not more than 100 ppb and a radioactive element content of not more than 10 ppb, comprising the steps of dissolving a metal or metal compound, the metal selected from the group consisting of molybdenum and tungsten, into an acid or ammonia to form an aqueous metal-containing solution, filtering the aqueous solution causing the aqueous metal-containing solution to form metal-containing crystals by adjusting temperature and composition of the solution, collecting the crystals by solid-liquid separation, washing and drying the collected crystals, reducing the dried crystals by heating in the presence of high-purity hydrogen to prepare a high-purity metal powder, compacting the powder, sintering the compact, electron beam melting the sintered compact to produce a high-purity metal ingot, and thereafter plastically working the ingot with subsequent machining.

4,619,696

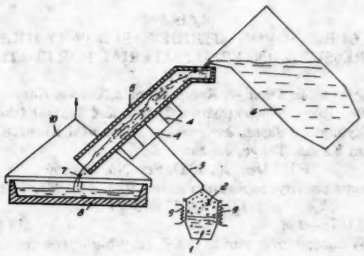
ADDITIVE FOR METALLURGICAL LIQUIDS, AND METHOD AND DEVICE FOR THE PREPARATION THEREOF

Mario D. Gorgerino, Milan, Italy, assignor to O.E.T. - Metalconsult S.r.l., Milan, Italy

Filed Dec. 3, 1984, Ser. No. 677,644

Int. Cl.[4] C22C *33/08*

U.S. Cl. 75—130 R 8 Claims



1. An additive for metallurgical liquids, in the form of an alloy comprising at least one first substance acting as a liquid phase solvent and at least one second substance acting as a gaseous phase solute, said first substance having semiconductor characteristics and being selected from the group consisting of: silicon, germanium; silicon and germanium alloyed with each other and with elements from the IA, IIA, IIIA and B, IVA, VIA, VIIA and VIII groups of the Periodic Table, and $A^{III}A^{V}$ and $B^{II}A^{VI}$ compounds, wherein II, III, V and VI are the respective groups in the Periodic Table and mixture thereof, said second substance having a high vapor pressure and being selected from the group consisting of lithium, sodium, potassium, magnesium, calcium, strontium, barium, zinc, cadmium, phosphorus, arsenic, antimony, bismuth, selenium, tellurium, bromine, iodine in the elemental state or in the state of oxides or salts thereof and mixture thereof, said second substance having at least part of the molecules thereof dissociated into atoms, ions, or radials of said molecules, the weight ratio of the first substance to the second substance being in the 10^{-6}% to 99% range.

4,619,697

SPUTTERING TARGET MATERIAL AND PROCESS FOR PRODUCING THE SAME

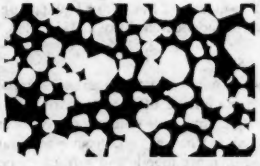
Kenichi Hijikata, Urawa; Tadashi Sugihara, and Masashi Komabayashi, both of Ohmiya, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,935

Claims priority, application Japan, Aug. 30, 1984, 59-181553; Aug. 30, 1984, 59-181551; Aug. 30, 1984, 59-181552; Nov. 1, 1984, 59-230996; Dec. 5, 1984, 59-256803; Jan. 16, 1985, 60-5157

Int. Cl.[4] C22C *29/00*

U.S. Cl. 75—230 23 Claims



1. A process for producing a sputtering target material that is low in oxygen content and is used for forming a metal silicide

film suitable for use in electrode wiring in a semiconductor device, said process comprising the steps of preparing a calcined body composed of at least one silicide-forming metal component and a silicon component, and impregnating molten silicon in said calcined body by means of contact with said molten silicon, thereby forming a sintered body with low oxygen content that is made of a metal silicide and silicon.

4,619,698

CUBIC BORON NITRIDE-BASED VERY HIGH PRESSURE-SINTERED MATERIAL FOR CUTTING TOOLS

Fumihiro Ueda, Ohmiya; Kaoru Kawada, Urawa; Kazuo Yamamoto, Tokyo; Noriaki Miwa, Tokyo, and Toshiki Ishimatsu, Tokyo, all of Japan, assignors to Mitsubishi Kinzoku Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 20, 1983, Ser. No. 563,666

Claims priority, application Japan, Jun. 29, 1981, 56-100980

Int. Cl.[4] B22F *3/14*

U.S. Cl. 75—238 **18 Claims**

1. A cubic boron nitride-based very high pressure-sintered material for use in cutting tools, consisting essentially of from 1 to 20 percent by weight of at least one compound selected from the group consisting of titanium carbide and titanium carbo-nitride, from 1 to 20 percent by weight of at least one body-centered cubic intermetallic compound selected from the group consisting of CoAl, NiAl, and (Co, Ni)Al; and from 75 to 97 percent by weight of cubic boron nitride and inevitable impurities.

13. A method of manufacturing a tough cubic boron nitride-based very high pressure-sintered material for use in cutting tools, comprising:

admixing the following powders:

(1) powder of at least one compound selected from the group consisting of titanium carbide and titanium carbo-nitride;

(2) powder of at least one intermetallic compound selected from the group consisting of CoAl, NiAl, and (CO, Ni)Al; and

(3) powder of cubic boron nitride and inevitable impurities; to form a homogeneous mixture having a predetermined blended composition of from 1 to 20 percent by weight of said powder (1), from 1 to 20 percent by weight of said powder (2), and from 75 to 97 percent by weight of said powder (3);

pressing said mixture into a green compact; and

sintering said green compact to form a tough cubic boron nitride.

4,619,699

COMPOSITE DISPERSION STRENGTHENED COMPOSITE METAL POWDERS

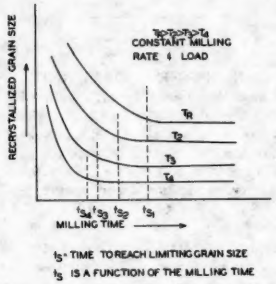
Ruzica Petkovic-Luton, Summit, and Joseph Vallone, Roselle, both of N.J., assignors to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation-in-part of Ser. No. 524,026, Aug. 17, 1983, abandoned. This application May 2, 1985, Ser. No. 729,742

Int. Cl.[4] B22F *9/00*

U.S. Cl. 75—252 **23 Claims**

1. A composite metal powder wherein essentially each powder particle is comprised of one or more metals and one or more refractory compounds wherein the powder particles are characterized as (a) having a cohesive internal structure in which the one or more metals and refractory compounds are intimately united to provide an interdispersion of comminuted fragments of said metals and refractory, (b) having the refractory substantially homogeneously dispersed throughout the metal matrix, and (c) being substantially free of oxide scale; wherein the composite metal powder particles have a mean



size less than about 50 microns and a mean grain size within the powder particles of less than about 0.6 microns.

4,619,700

WOOD IMPROVER AND A METHOD OF IMPROVING THE QUALITY OF WOOD

Yasutsugu Yamada, Sapporo, Japan, assignor to Nippon Tensaiseito Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 532,486, Sep. 15, 1983, Pat. No. 4,560,619. This application Sep. 11, 1985, Ser. No. 774,726

Claims priority, application Japan, Sep. 18, 1982, 57-161592

Int. Cl.[4] C09D *5/14, 5/16, 5/18;* C08L *97/02*

U.S. Cl. 106—15.05 **8 Claims**

1. A wood improver comprising pulp waste liquor having a solids content adjusted to 20–60% (w/w) and an effective amount of at least one member selected from the group consisting of an insecticide, a fire retardant, an agent for preventing discoloration, Steffen waste liquor from a beet sugar plant and polyethylene glycol, said pulp waste liquor being selected from kraft pulp waste liquor and semichemical pulp waste liquor derived from the digestion of pulp.

4,619,701

ISOLATING AGENT

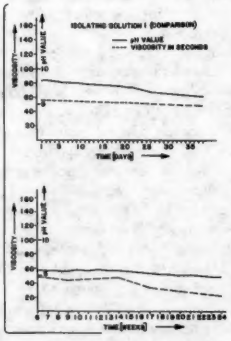
Michael Angrick, Berlin, and Martin-Willi Späth, Wehrheim, both of Fed. Rep. of Germany, assignors to Kulzer & Co. GmbH, Wehrheim, Fed. Rep. of Germany

Filed Apr. 16, 1985, Ser. No. 723,738

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424538

Int. Cl.[4] B28B *7/36*

U.S. Cl. 106—38.23 **6 Claims**



1. Isolating agent of an aqueous alginate solution containing

a preservative and a buffer with a pH between 5.5 and 8.5, characterized in that the buffer mixture consists of glycine and sodium hydroxide.

4,619,702

RARE EARTH MODIFIERS FOR PORTLAND CEMENT

Ellis M. Gartner, Glenview, Ill., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed May 15, 1984, Ser. No. 610,345
Int. Cl.[4] C04B 7/02
U.S. Cl. 106—89 34 Claims

1. A particulate raw cement mix comprising bastnasite, a calcium oxide component and a silicon dioxide component.

14. A particulate portland cement composition comprising a thermally processed material containing between about 0.01 and about 0.20 weight percent of at least one rare earth component, calculated as REO, said rare earth component selected from the group consisting of cerium, europium, samarium, praseodymium, neodymium, gadolinium and compounds thereof, and said composition having a surface area less than about 6000, calculated as Blaine fineness in cm^2/gram.

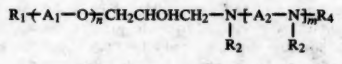
4,619,703

STABLE AQUEOUS DISPERSIONS OF NON-OXIDIZED PARAFFIN WAX

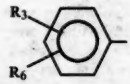
Hans Gerber, Allschwil, and Eckart Schleusener, Reinach, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 537,119, Sep. 29, 1983, abandoned. This application Nov. 30, 1984, Ser. No. 676,590
Claims priority, application Fed. Rep. of Germany, Oct. 4, 1982, 3236672
Int. Cl.[4] C08L 91/06; D06M 13/34
U.S. Cl. 106—271 23 Claims

1. An aqueous wax dispersion in which substantially all of the wax is non-oxidised paraffin wax having a drip point ≧30° C. such that the acid number of the total wax present is less than 1, said dispersion containing an amount sufficient to disperse the wax in the water of a surfactant comprising one or more compounds of formula I

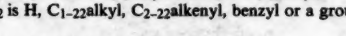


in which R_1 is R_xCOO—, R_xCONH— or R_yO—
where R_x is C_{7-21}alkyl or C_{7-21}alkenyl
and R_y is C_{8-22}alkyl, C_{8-22}alkenyl or a group (α)



(α)

where R_3 is H or C_{1-9}alkyl and R_6 is C_{4-12}alkyl;
R_2 is H, C_{1-22}alkyl, C_{2-22}alkenyl, benzyl or a group (b)

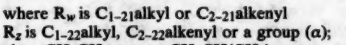


(b)

R_4 is H, C_{1-22}alkyl, C_{2-22}alkenyl or a group (b);
R_5 is a group (c), (d) or (e)

(c)

(d)



(e)

where R_w is C_{1-21}alkyl or C_{2-21}alkenyl
R_z is C_{1-22}alkyl, C_{2-22}alkenyl or a group (α);
A_1 is $—CH_2CH_2—$ or $—CH_2CH(CH_3)—$;
A_2 is C_{2-6}alkylene;
n is 2–20;
m is 0–4;
p is 0 or 1;
q is 0–19;
and r is 0 or 1;
with the provisos that $(p+q+r) \geqq 1$ and whenever a symbol appears more than once it may have the same or different significance, or protonated or quaternised derivatives thereof.

4,619,704

COMPOSITION FOR FORMING A TRANSPARENT CONDUCTIVE FILM

Tadanori Hashimoto; Hiroshi Yoshitake; Shigenao Hata, and Akiko Nakazono, all of Osaka, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Dec. 12, 1984, Ser. No. 680,729
Claims priority, application Japan, Dec. 22, 1983, 58-242534
Int. Cl.[4] C09D 1/00
U.S. Cl. 106—286.4 3 Claims

1. A composition for forming a transparent conductive film comprising a mixture of an organic solution of an indium salt of an inorganic acid and a tin salt of an inorganic acid with a non-aqueous silica sol wherein said composition contains about 0.5% to about 30% by weight of said indium salt of inorganic acid calculated as indium oxide, about 0.5% to about 30% by weight of said tin salt of inorganic acid in terms of the proportion of tin to indium, and about 1% to about 200% by weight of said non-aqueous silica sol in terms of the proportion of SiO_2 to indium oxide.

4,619,705

NONIONIC SURFACTANT TREATED CLAYS, METHODS OF MAKING SAME, WATER-BASED PAINTS, ORGANIC SOLVENT-BASED PAINTS AND PAPER COATINGS CONTAINING SAME

Dan M. Dixon, Gordon, and Richard J. Drexel, Jr., Irwinton, both of Ga., assignors to Engelhard Corporation, Edison, N.J.

Continuation of Ser. No. 629,606, Jul. 11, 1984, abandoned. This application Jan. 17, 1986, Ser. No. 820,884
Int. Cl.[4] C04B 14/10
U.S. Cl. 106—288 B 33 Claims

1. A treated clay for use as a filler in organic solvent-based paints and water-based paints to improve the gloss of dried films thereof and in paper coatings to improve the gloss ink holdout properties of paper coating with same, said treated clay consisting essentially of a mixture of kaolin clay particles and an effective amount of a nonionic surfactant compatible with water and oil and having an HLB value in the range of 3 to 15.

4,619,706

METHOD FOR STRIPPING ORGANIC COATINGS FROM SUBSTRATES

David G. Squires; Lloyd Hundley, both of Cincinnati, and Raymond A. Barry, Powell, all of Ohio, assignors to Texo Corporation, Cincinnati, Ohio

Continuation-in-part of Ser. No. 706,475, Feb. 28, 1985, abandoned. This application Sep. 24, 1985, Ser. No. 779,562
Int. Cl.[4] C23G 1/00
U.S. Cl. 134—2 6 Claims

1. A method of stripping organic coatings from a coated substrate comprising the steps of subjecting said coated substrate to a two-phase liquid bath for a predetermined time, said bath comprising an organic solvent phase dispersed in an aqueous phase, said phases being relatively insoluble in one another; and agitating said liquid bath to maintain a relatively uniform state of dispersion of said organic phase in said aqueous phase and maintaining the two-phase relationship between said organic and aqueous phases in said dispersed state; said organic solvent phase comprising one or more components taken form a group consisting of glycol phenol ethers and ethoxylated furfuryl alcohol.

4,619,707

METHOD FOR CHEMICALLY REMOVING ALUMINUM DIFFUSION LAYERS

Manfred Hirschmeier, Karlsfeld, and Josef Kreitl, Viehbach, both of Fed. Rep. of Germany, assignors to MTU Motoren- und Turbinen-Union Muenchen GmbH, Munich, Fed. Rep. of Germany

Filed Jan. 14, 1985, Ser. No. 691,481

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1984, 3414383

Int. Cl.[4] C23G *1/02*

U.S. Cl. 134—3 **8 Claims**

1. A method for chemically removing a continuous aluminum diffusion layer having a given thickness from a work piece surface without attacking the work piece material, comprising the following steps:

(a) preparing a batch of an aqueous solution containing:

nitrobenzenesulfonic acid,

sodium cyanide,

sodium hydroxide, and the remainder being water; whereby said sodium cyanide constitutes a main ingredient proportion of the batch, wherein said sodium hydroxide corresponds to about one tenth by weight of the main ingredient, and wherein said nitrobenzenesulfonic acid corresponds to less than about fifty percent by weight of said main ingredient,

(b) and exposing said work piece surface to said aqueous solution for a length of time sufficient for the removal of said aluminum diffusion layer thickness and at a temperature below about 80° C.

4,619,708

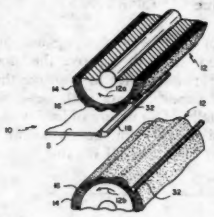
FLEXIBLE SHEET CLEANING APPARATUS AND METHOD

Carl P. Bothner, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 19, 1984, Ser. No. 683,733

Int. Cl.[4] B08B *7/00, 7/02*

U.S. Cl. 134—6 **8 Claims**



1. In an apparatus for cleaning a flexible sheet moving along a travel path, such sheet having a leading edge portion extending transverse to such travel path, said apparatus including a brush having a fibrous surface adapted to be moved in intercepting relation with such travel path to clean such moving sheet, mechanism for enabling substantial free passage of said leading edge portion by said fibrous surface comprising:

means, located adjacent to such travel path, for engaging said moving fibrous surface upstream of the area of intercept of said surface with such travel path to generate a standing wave in said surface, such wave causing said surface to temporarily move away from such travel path; and

means, coupled to said engaging means, for selectively moving said engaging means into engagement with said moving fibrous surface to generate said standing wave in advance of contact of said leading edge portion with said surface thereby enabling said leading edge portion to move through said intercept area without contacting said surface and positioning said surface in contact with the portion of said sheet following said leading edge portion.

7. Method of cleaning a moving flexible sheet, having a leading edge portion, using a brush for brushing the surface of the moving sheet, said method comprising the steps of:

sensing the approach of a leading edge portion to the brush; and

generating a standing wave in the bristles of the brush to temporarily deflect the bristles around the leading edge portion and to return such bristles into cleaning contact with the portion of the sheet web immediately adjacent to the leading edge portion.

4,619,709

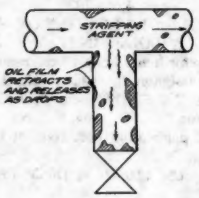
CHEMICAL TREATMENT FOR IMPROVED PIPE LINE FLUSHING

Robert J. Flocco, Summit, N.J., assignor to Exxon Research and Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 386,705, Jun. 9, 1982, abandoned. This application May 31, 1984, Ser. No. 615,565

Int. Cl.[4] B08B *9/00*

U.S. Cl. 134—22.14 **6 Claims**



1. A method for removing residual hydrocarbon fluids from the internal surfaces of pipe systems comprising: contacting the residual hydrocarbon fluids with a water solution containing a hydrocarbon-stripping agent which is capable of decreasing the wetting characteristics of the residual hydrocarbon fluids on the internal surfaces of the pipe system whereby the hydrocarbon fluid retracts and forms droplets, said hydrocarbon-stripping agent being selected from the group consisting of (a) mixtures of sorbitan monoesters of C_{10} to C_{20} aliphatic carboxylic acids and polyoxalkylene adducts of the sorbitan monoesters wherein said mixtures have a HLB number in the range of from about 5 to about 9, (b) mixtures of sorbitan monoesters of C_{10} to C_{20} aliphatic carboxylic acids and polyoxalkylene adducts of the sorbitan monoesters having a HLB number in the range of from about 9 to 12 with dialkyl sulfosuccinate salts in amounts ranging from about 10% to about 40% by volume of the mixture, and (c) mixtures of either of the foregoing groups with up to 2 parts by volume of a paraffinic solvent and thereafter removing said residual hydrocarbon fluid droplets with the water solution.

4,619,710

DISPOSER CLEANER

Cary K. Kuenn, Milwaukee; Jean M. Young, and John A. Wundrock, both of West Bend, all of Wis., assignors to Badger Pharmacal, Inc., Jackson, Wis.

Continuation of Ser. No. 602,544, Apr. 20, 1984, abandoned. This application Dec. 3, 1985, Ser. No. 804,243

Int. Cl.[4] B08B *3/08, 3/10, 7/00*; C11D *17/00*

U.S. Cl. 134—22.17 **10 Claims**

5. A method of cleaning a food-receiving chamber of a garbage disposer unit, comprising the steps of:

passing water at a rate of about 0.5 to about 4.0 gal./min. and at a temperature of between about 90° F. to about 140° F. through said chamber for about one minute;

reducing the flow of water through said chamber to between about 0.05 to about 0.25 gal./min.;

introducing a container containing a cleaning composition comprising 5–75% by weight of an alkali carbonate, 5–75% by weight of an acid and 5–75% by weight of one or more surfactants into said chamber;

actuating said disposer unit for about 3 to about 5 minutes to shred said container and release said composition within said chamber so that said composition reacts with said water to effervesce and coat the surfaces of said chamber; and

deactuating said disposer unit after foaming of said composition is completed.

8. A product for cleaning a food-receiving chamber of a garbage disposer unit, comprising:

a cleaning composition including 5–75% by weight of an alkali carbonate, 5–75% by weight of an acid, and 5–75% by weight of one or more surfactants, said cleaning composition comprises about 37.5% by weight sodium bicarbonate, about 37.5% by weight adipic acid, and about 25% by weight of a mixture of about 5–95% by weight sodium aluryl sulfate and about 95–5% by weight alpha-olefinsulfonate; and

a packet containing said cleaning composition composed of a biodegradable, disposable material that disintegrates upon actuation of said disposer unit into fragments which aid in scrubbing the wall surfaces of the disposer cleaner.

4,619,711
PAINT STRIPPING FOAM

Peter Olbrueck, Ratingen; Hermann Kluth, Duesseldorf; Bernhard Roederhoff, Duesseldorf; Wolfgang Dierichs, Duesseldorf, and Juergen Wegner, Duesseldorf, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf, Fed. Rep. of Germany

Filed Aug. 20, 1985, Ser. No. 767,542

Claims priority, application Fed. Rep. of Germany, Sep. 24, 1984, 3434985

Int. Cl.⁴ B08B *7/00;* **C23D** *17/00;* **C09K** *13/02;* **B44C** *1/22*

U.S. Cl. 134—38 **19 Claims**

1. An aqueous alkaline paint stripper composition which forms a foam when dispersed from an aerosol container comprising:

A. from about 47 to about 94% by weight of an aqueous solution containing from about 5 to about 40% by weight of at least one strongly alkaline substance,

B. from about 1 to about 8% by weight of at least one surfactant,

C. from about 5 to about 30% by weight of at least one propellant,

D. from 0 to about 5% by weight of at least one foam stabilizer and/or thickener, and

E. from 0 to about 10% by weight of at least one water-miscible organic solvent.

16. A method for stripping hydrolyzable paint coatings on alkali-stable substrates comprising applying thereto a foam layer of the composition of claim 1 at ambient temperature.

4,619,712
SUPERPLASTIC ALUMINUM ALLOY STRIPS AND PROCESS FOR PRODUCING THE SAME

Hitoshi Miyamoto, Kawasaki; Masanori Momochi, Machida, and Ryoji Mishima, Yokohama, all of Japan, assignors to Mitsubishi Light Metal Industries Limited, Tokyo, Japan

PCT No. PCT/JP82/00434, § 371 Date Jul. 7, 1983, § 102(e) Date Jul. 7, 1983, PCT Pub. No. WO83/01629, PCT Pub. Date May 11, 1983

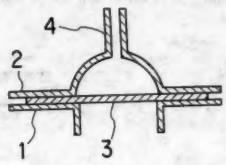
Division of Ser. No. 519,778, Jul. 7, 1983, abandoned. This PCT application Nov. 9, 1982, Ser. No. 589,850

Claims priority, application Japan, Nov. 10, 1981, 56-180247

Int. Cl.⁴ C22F *1/047*

U.S. Cl. 148—2 **3 Claims**

2. A process according to claim 1, wherein in the course of said cold rolling, said strip is subjected to intermediate annealing and the annealed strip is subjected to further cold rolling



until the reduction ratio reaches up to a value of not less than 60%.

4,619,713
METHOD OF PRODUCING NODULAR GRAPHITE CAST IRON

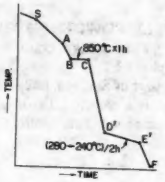
Makoto Sueaaga; Mitsuru Yano; Yasuoki Ishihara, and Kohki Ohtsuka, all of Fukuoka, Japan, assignors to Hitachi Metals, Ltd., Tokyo, Japan

Filed Oct. 5, 1983, Ser. No. 538,821

Claims priority, application Japan, Feb. 25, 1983, 58-30471; Feb. 25, 1983, 58-30472

Int. Cl.⁴ C21D *5/00*

U.S. Cl. 148—3 **8 Claims**



1. A method of producing nodular graphite cast iron comprising:

pouring a melt having a nodular graphite cast iron composition into a mold;

solidifying the melt in the mold to form a casting;

removing the casting from the mold at a predetermined temperature above the A_1 transformation temperature;

rapidly cooling the casting at a cooling rate sufficient to prevent the generation of pearlite;

stopping the rapid cooling at a temperature above the M_S point;

substantially isothermally transforming the casting to form a matrix structure consisting essentially of bainite; and

cooling the casting to normal temperature.

4,619,714
CONTROLLED ROLLING PROCESS FOR DUAL PHASE STEELS AND APPLICATION TO ROD, WIRE, SHEET AND OTHER SHAPES

Gareth Thomas, Berkeley; Jae-Hwan Ahn, Albany, both of Calif., and Nack-Joon Kim, Laramie, Wyo., assignors to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 638,046, Aug. 6, 1984. This application Nov. 29, 1984, Ser. No. 676,066

Int. Cl.⁴ C21D *7/14, 7/10*

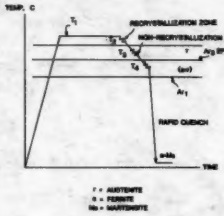
U.S. Cl. 148—12 B **4 Claims**

1. In a method for producing a high strength, high ductility steel characterized by an ultra-fine fibrous ferrite-lath martensite microstructure, comprising heating a steel composition at a temperature T_1 for a period sufficient to substantially completely austenize said composition;

hot rolling said composition in the austenite recrystallization region at a temperature T_2 and further rolling in the non-

recrystallization γ-region at temperature T_3; the improvement comprising the steps of

rolling said composition at a temperature T_4; wherein T_4 is



a temperature below the effective transition point Ar_3, within the $(\alpha+\gamma)$ region, and

rapidly quenching said composition to an ambient temperature to convert the austenite to lath martensite.

4,619,715

FUSIBLE POWDERED METAL PASTE

Jennie S. Hwang, Pepper Pike, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 649,493, Sep. 11, 1984, Pat. No. 4,557,767, which is a continuation-in-part of Ser. No. 546,794, Oct. 31, 1983, abandoned. This application Dec. 9, 1985, Ser. No. 806,779

Int. Cl.[4] B23R *35/34*

U.S. Cl. 148—23 38 Claims

1. An improved essentially nonaqueous noncorrosive inorganic salt free paste vehicle for soft solder metal powder, said vehicle comprising a nonhydrocarbon resinous binder in which is dispersed a nonaqueous organic liquid composition, said composition having a surface tension of from 43 to 65 or higher dynes/cm. at 20° C.

4,619,716

METHOD OF BRAZING AN ALUMINUM MATERIAL

Kenichi Suzuki, and Fusayoshi Miura, both of Aichi, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Japan

Filed Oct. 10, 1984, Ser. No. 659,423

Claims priority, application Japan, Oct. 13, 1983, 58-191311; Nov. 7, 1983, 58-208822; Dec. 9, 1983, 58-233362; Dec. 16, 1983, 58-238564; Jul. 31, 1984, 59-162175; Aug. 14, 1984, 59-170251; Aug. 20, 1984, 59-173530

Int. Cl.[4] B23K *35/34*

U.S. Cl. 148—26 32 Claims

1. A method of brazing an aluminum material which comprises: a chemical conversion coating step of bringing at least a brazing desired part of the aluminum material into contact with a treating solution containing potassium and fluorine ions to form a brazing flux layer composed of potassium pentafluoroaluminate on the surface of said aluminum material; and a brazing step of heating at least the flux layer formed part to a temperature of lower than the melting point of the aluminum material and higher than the melting point of a brazing alloy to join said aluminum material to a counterpart material with said brazing alloy.

4,619,717

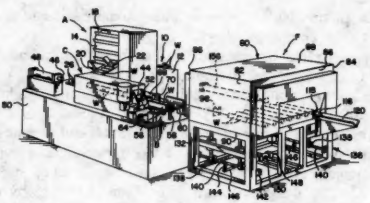
HEATING MAGNETIC METAL WORKPIECES

Norbert R. Balzer, and David R. Soworowski, both of Boaz, Ala., assignors to Park-Ohio Industries, Inc., Shaker Heights, Ohio

Filed Apr. 23, 1984, Ser. No. 602,914

Int. Cl.[4] H01F *1/04*

U.S. Cl. 148—112 8 Claims



1. The method of heating a workpiece of magnetic metal from about ambient temperature to a selective elevated processing temperature above the Curie point temperature of said workpiece metal comprising the steps of:

(a) initially inductively preheating the said workpiece from about ambient temperature to a preheat temperature of about the Curie point temperature of the workpiece metal in an induction heating coil energized by an electric power source; and,

(b) then immediately radiantly post-heating said workpiece to said processing temperature in the heating chamber of an electric radiant heat furnace.

4,619,718

METHOD OF MANUFACTURING A GROUP II–VI SEMICONDUCTOR DEVICE HAVING A PN JUNCTION

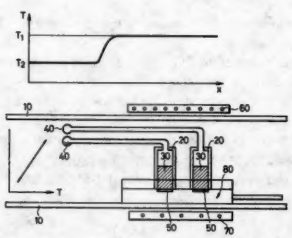
Jun-ichi Nishizawa, No. 6-16, Komegafukuro 1-chome, Sendai-shi, Miyagi-ken, Japan

Continuation-in-part of Ser. No. 266,042, May 21, 1981, abandoned. This application Jul. 10, 1984, Ser. No. 628,974

Claims priority, application Japan, Jun. 12, 1980, 55-79805

Int. Cl.[4] H01L *21/368, 21/383, 21/388*

U.S. Cl. 148—171 7 Claims



1. A method of manufacturing a semiconductor device having a pn junction formed in a Group II–VI compound semiconductor crystal, comprising:

preparing an n-type Group II–VI compound semiconductor crystal by the temperature difference method under controlled vapor pressure of the crystal-constituting Group VI element from a melt that contains constituting elements; and

forming a p type semiconductor region on top of said n-type semiconductor region by an epitaxial growth technique using a temperature difference method under controlled vapor pressure of said crystal-constituting Group VI element from a melt that contains essentially constituting

elements of the crystal and an impurity having a p type conductivity.

4,619,719

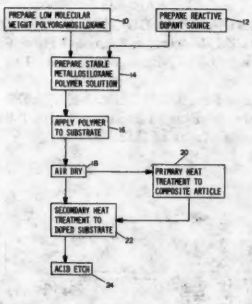
PROCESS FOR FORMING A DOPED OXIDE FILM AND COMPOSITE ARTICLE

Ian M. Thomas, Temperance, Mich., and James J. Tillman, Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 604,713, Apr. 27, 1984, abandoned, which is a continuation of Ser. No. 343,667, Jan. 28, 1982, abandoned. This application Jan. 27, 1986, Ser. No. 822,942

Int. Cl.[4] H01L *21/385*

U.S. Cl. 148—188 24 Claims



22. A process for doping a semiconductor substrate material comprising:

a. combining a silicon tetra-alkoxide of the formula SiX_4 wherein X is OR, wherein R is an alkyl group of one to six carbon atoms with less than a stoichiometric amount of water, in the presence of an acid hydrolysis catalyst that is a strong mineral acid, to prepare a solution of a low molecular weight polyorganosiloxane;

b. reacting said polyorganosiloxane with a soluble reactive dopant source compound containing P as a dopant element to form a solution of a siloxane polymer;

c. coating said siloxane polymer onto said substrate material;

d. converting the coating formed in step c to a glassy layer on said substrate material; and

e. heating said glassy layer coated substrate material for a time sufficient and at a temperature sufficient to diffuse said dopant from the glassy layer into said substrate material.

4,619,720

MAGNETIC AMORPHOUS ALLOYS COMPRISING CO, FE, ZR, AND NB

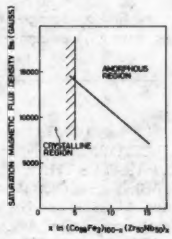
Ikuo Sakai, Sagamihara; Hiroyasu Karimoto, Tokyo, and Yasuhiko Nakayama, Kawasaki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Sep. 4, 1984, Ser. No. 647,185

Claims priority, application Japan, Sep. 1, 1983, 58-161357

Int. Cl.[4] C22C *19/07*

U.S. Cl. 148—403 3 Claims



1. A magnetic amorphous alloy having a compositional formula

$$(Co_{100-y}Fe_y)_{100-x}(Zr_{100-w}Nb_w)_x$$

in which $5 \leqq x \leqq 10$, $0.5 \leqq y \leqq 4$, and $20 \leqq w \leqq 90$.

4,619,721

EMULSION-CONTAINING EXPLOSIVE COMPOSITIONS

Lawrence A. Cescon, Portogruaro, Italy, and Robert W. Trebilcock, Littleton, Colo., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 15, 1985, Ser. No. 787,442

Int. Cl.[4] C06B *45/02*

U.S. Cl. 149—21 27 Claims

1. In a storage-stable emulsion blend explosive comprising a sensitized blend of inorganic oxidizing salt particles and a water-in-oil emulsion comprising a carbonaceous fuel having compenents which form a continuous emulsion phase, an aqueous solution of an inorganic oxidizing salt forming a discontinuous phase dispersed as discrete droplets within said continuous phase, and an emulsifying agent, the improvement comprising inorganic oxidizing salt particles containing at least about 15 percent by weight of a fines component comprised of inorganic oxidizing salt particles which are smaller than 297 micrometers, the weight ratio of said emulsion to the total inorganic oxidizing salt particles being in the range of about from 20/80 to 70/30.

4,619,722

PROPELLANT MATERIAL WITH OXIDIZER REDUCTION TO LEAD OXIDE

Frank A. Marion, Glendale, Ariz., assignor to Universal Propulsion Company, Inc., Phoenix, Ariz.

Filed Sep. 12, 1983, Ser. No. 530,956

Int. Cl.[4] C06B *33/14*

U.S. Cl. 149—41 35 Claims

1. In combination for use a propellant,

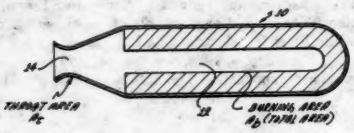
a binder also constituting a reducing agent,

a first oxidizing material containing lead and oxygen,

a second oxidizing material containing oxygen and a metal other than lead,

a fuel additive comprising a material selected from a group consisting of aluminum, beryllium, magnesium, lithium and titanium,

the first and second oxidizing materials and the fuel additive being provided in relative percentages by weight to obtain



a reduction of the first oxidizing material to lead oxide, rather than lead, during the combustion of the propellant.

4,619,723

METHOD FOR PREFORMATION OF CUSHION AND APPARATUS THEREFOR

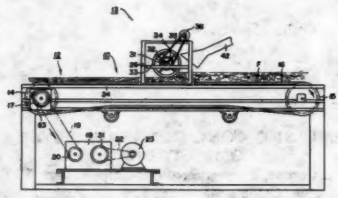
Sadaaki Takagi, 39, Mikage-cho, Okazaki-shi, Aichi-ken, Japan

Filed Aug. 14, 1981, Ser. No. 292,907

Claims priority, application Japan, Aug. 18, 1980, 55-112664; Aug. 18, 1980, 55-112665; Jun. 23, 1981, 56-95960

Int. Cl.[4] D04H *1/48*

U.S. Cl. 156—62.2 **17 Claims**



1. A method for the preformation of a cushion for a seat with a prescribed, sculptured profile, characterized by forming a belt of fluffy, resiliently-compressible aggregate of three-dimensional, curled, short-fiber filaments on a conveyor means, causing said conveyor means carrying thereon said aggregate of filaments to be advanced under a rotary scraping member the outer surface of which comprises a multiplicy of transversely and circumferentially-spaced, axially-oriented, scraping needles while keeping said rotary scraping member in rotation and said scraping needles in contact with the advancing aggregate of filaments in a manner such that part of the filaments is scraped from surface portions of said aggregate to give said aggregate of filaments the desired prescribed, sculptured profile, wherein the scraping is effected across substantially the entire width of the aggregate of filaments with the transversely-disposed needles having different lengths corresponding to a prescribed, sculptured transverse profile.

13. An apparatus for the preformation of a cushion for a seat with a prescribed, sculptured profile, comprising conveyor means, means for forming a belt of fluffy, resiliently-compressible aggregate of three-dimensionally curled, short-fiber filaments and scraping means formed of a rotary scraping member disposed transversely on said conveyor means and comprising at the outer surface thereof a multiplicity of transversely and circumferentially-spaced, axially-oriented, scraping needles having a sculpturing transverse profile corresponding to the desired prescribed, sculptured profile, and wherein the rotary member comprises a cylindrical body which has a fixed diameter and wherein said needles project axially and extend over substantially the entire width of the conveyor means with the transversely-disposed needles having different lengths corresponding to a prescribed sculptured, transverse profile.

4,619,724

METHOD FOR PRODUCING FABRIC AND GARMENTS

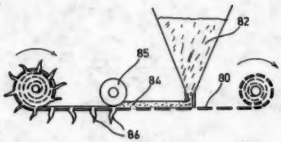
Yser Chatow, 15 Rehov HaAviv, Petach Tikva, Israel

Filed Sep. 20, 1982, Ser. No. 420,691

Claims priority, application Israel, Dec. 20, 1981, 64594

Int. Cl.[4] B32B *5/16*

U.S. Cl. 156—72 **13 Claims**



1. A method for producing a fabric item comprising the steps of:

producing a perforated stretchable substrate in the shape of the desired fabric item and having a multiplicity of perforations extending therethrough;

providing a pressurized flow of a liquid to said substrate producing a pressure gradient for inflating said substrate, thereby stretching it and expending the perforations thereof thereby to facilitate the entry of fibers thereinto;

supplying fibers to said pressurized flow of said liquid thereby causing said fibers to engage the perforations in said substrate by driving said fibers itno said enlarged perforations through means of said pressurized liquid in which said fibers are suspended;

terminating said pressurized flow of said liquid; and

retaining said fibers in the perforations to define said fabric item.

4,619,725

METHOD OF PRODUCING A HEADREST

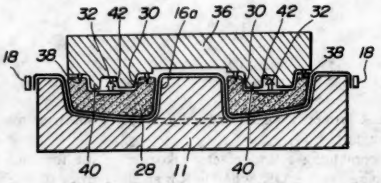
Masakazu Muraishi, Isehara, and Kazumi Hira, Fujisawa, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 9, 1985, Ser. No. 773,539

Claims priority, application Japan, Sep. 10, 1984, 59-190109

Int. Cl.[4] B32B *31/04*

U.S. Cl. 156—182 **5 Claims**



1. A method of producing a headrest, comprising in steps:

(a) preparing a lower mold formed with a rectangular gutter-like cavity leaving at the central portion a central land;

(b) extending a thermoplastic film over the shaped work face of the lower mold;

(c) heating said thermoplastic film to soften the same;

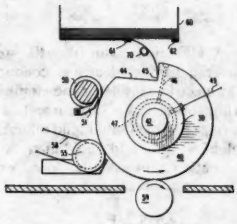
(d) placing an upper mold with a counter-shaped face onto the work face of said lower mold to provide a molded article of the thermoplastic film;

(e) applying the inner surface of the molded article with adhesive;

(f) putting a pad of shock absorbing material into said molded article;

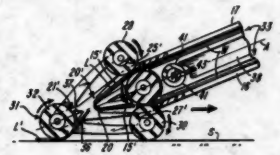
(g) pressing said pad against said molded article to assure bonding therebetween;
(h) cutting the molded article at the portions other than the portions which substantially cover the pad thereby to provide freely movable fragments of the film;
(i) folding back the fragments of the film to cover the remained naked portions of said pad thereby to provide one pad unit;
(j) preparing another pad unit by carrying out the same producing steps;
(k) putting the two pad units together in face-to-face relationship with a core member installed therebetween; and
(l) thrusting welts between the mutually facing faces of the assembled first and second pads.

4,619,726
LABEL APPLICATOR
Stephen F. Cook, Westfield; Harland S. Fisher, Longmeadow, and Theodore E. Kosciuczyk, Worcester, all of Mass., assignors to Westvaco Corporation, New York, N.Y.
Filed May 13, 1985, Ser. No. 733,323
Int. Cl.[4] B65C *9/02, 9/10, 9/14*
U.S. Cl. 156—366 **10 Claims**



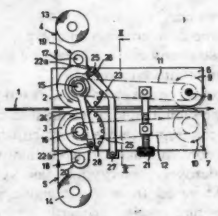
1. An apparatus for transferring label sheets from a supply magazine to the surface of a substrate article comprising:
label magazine means for confining a stack of label sheets having outer faces and inner faces, respectively, said labels being stacked in said magazine with the inner face toward a bottom end of said magazine, said bottom end having a partially open area for withdrawal of a label sheet therefrom;
oscillating picker means for gripping the inner face of the bottom-most label sheet near one end thereof in the region of said partially open magazine bottom area at one oscillatory limit whereby said one end of said label sheet is drawn through said open area as said picker means is moved away from said magazine toward an opposite oscillatory limit;
rotatively driven applicator roll means having a substantially continuous cylindrical perimeter surface interrupted by one notch means projecting radially into said surface and extended axially across said surface, said applicator roll means including label sheet vacuum gripping means within said applicator roll positioned along a line parallel with and adjacent to an abrupt edge in said surface respective to said notch means, said magazine means, picker means and applicator roll means being relatively positioned and operatively timed whereby said picker means places said one end of said label sheet into the rotating notch means at an opposite oscillatory limit of said picker means for abutment by said abrupt edge and reversal of said label sheet into outer face contact with said applicator roll surface, said label sheet being held to said applicator roll surface by said vacuum gripping means to be completely withdrawn from said magazine by continued rotation of said applicator roll;
end-less conveyor means for movement of an article past and proximate of the perimeter of said rotating applicator roll for receipt of said label sheet from said applicator roll; and,
timing means for coordinating the label sheet delivery position of said applicator roll to the article reception position of said conveyor means.

4,619,727
HAND-HELD LABELER
Paul H. Hamisch, Jr., Franklin, Ohio, assignor to Monarch Marking Systems, Inc., Dayton, Ohio
Filed Aug. 16, 1982, Ser. No. 408,310
Int. Cl.[4] B44C *1/00, 7/00;* **B32B** *31/00*
U.S. Cl. 156—541 **14 Claims**



1. A hand-held labeler for applying labels releasably adhered to a carrier web, comprising: a labeler body, the body having means for successively delaminating labels from the carrier web, means adjacent the delaminating means for applying labels, first, second and third feed rolls rotatably mounted by the body, the first and second feed rolls being disposed in feeding cooperation, the second the third rolls being disposed in feeding cooperation, the third feed roll projecting beyond the body and being cooperable with a surface to be labeled, means defining a feed path for the carrier web to between the first and second feed rolls, to and about the delaminating means, and to between the second and third feed rolls, and wherein the first and second feed rolls contact the labels and carrier web upstream of the delaminating means and the second and third feed rolls contact the carrier web downstream of the delaminating means.

4,619,728
LAMINATING APPARATUS
Fredericus J. Brink, Veenendaal, Netherlands, assignor to Ingenieursbureau Het Noorden B.V., Veenendaal, Netherlands
Filed Sep. 6, 1984, Ser. No. 647,571
Claims priority, application Netherlands, Sep. 7, 1983, 8303102
Int. Cl.[4] B30B *3/04, 15/34*
U.S. Cl. 156—555 **11 Claims**



1. An apparatus for laminating articles by applying a heat-activated first plastic foil to the top surface of said articles and a heat-activated second plastic foil to the bottom surface of said articles, comprising a first frame and a second frame and pivoting means for pivotably disposing said first frame with respect to said second frame, a first pressing roller rotatably supported on said first frame, a second pressing roller rotatably

supported on said second frame, driving means for rotating said first and second pressing rollers, said pivoting means moving said first frame between a first position where said first pressing roller is pressed against said second pressing roller and a second position where said first pressing roller is spaced from said second pressing roller, said first and second plastic foils being supplied to said first and second pressing rollers at least where said first and second pressing rollers press against one another when in said first position, lifting means for lifting said first and second plastic foils away from said first and second pressing rollers, respectively, when in said second position to permit said first and second pressing rollers to rotate freely, and heating means for heating said first and second pressing rollers.

4,619,729

MICROWAVE METHOD OF MAKING SEMICONDUCTOR MEMBERS

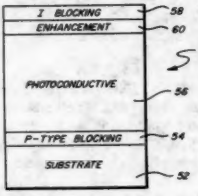
Annette G. Johncock, Royal Oak, and Stephen J. Hudgens, Southfield, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 580,081, Feb. 14, 1984. This application May 15, 1985, Ser. No. 734,576

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[4] C30B *25/02*

U.S. Cl. 156—606 18 Claims



1. An improved method of forming a semiconductor member, comprising:

providing a substrate;

providing a source of microwave energy;

providing a substantially enclosed reaction vessel and placing said substrate into said vessel;

introducing into said vessel at least one reaction gas, including at least one semiconductor element to be deposited;

Providing an operating pressure about an order of magnitude below a conventional RF deposition pressure;

coupling said microwave energy into said vessel to form a plasma in said vessel from said reaction gas, including forming depositing species, primarily free radicals, from the semiconductor element and forming molecular ions of the semiconductor element; and

depositing a semiconductor alloy member onto said substrate from said depositing species while controlling the plasma potential to alter ion bombardment of the depositing species, controlling said plasma potential including applying an external electrical bias to said substrate, said bias external to and separate from said substrate.

4,619,730

PROCESS FOR SOLIDIFICATION IN A MAGNETIC FIELD WITH A D.C. HEATER

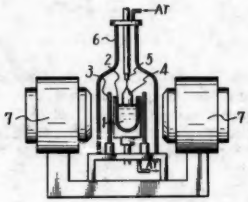
Toshihiko Suzuki; Nobuyuki Isawa; Yasunori Ohkubo, and Kinji Hoshi, all of Kanagawa, Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 188,519, Sep. 18, 1980, abandoned. This application Jan. 13, 1982, Ser. No. 339,065

Claims priority, application Japan, Sep. 20, 1979, 54-121339; Jan. 28, 1980, 55-8576; Jan. 28, 1980, 55-8577; Jan. 28, 1980, 55-8578

Int. Cl.[4] C30B *15/14*

U.S. Cl. 156—617 SP 7 Claims



1. A process for solidifcation comprising the steps of: providing a liquid material having electrical conductivity in a container made of an electrical insulator and eliminating strong vibration by applying substantially DC current to an electric heater which is energized to melt said liquid material, pulling a crystal which is solidified from said liquid material and applying a stationary magnetic field to said liquid material.

4,619,731

PROCESS FOR ETCHING VIA HOLES IN ALUMINA

Daniel A. Buttry, Laramie, Wyo.; Mohamad T. Krounbi, San Jose, and Owen R. Melroy, Morgan Hill, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 29, 1985, Ser. No. 792,409

Int. Cl.[4] B44C *1/22;* C03C *15/00, 25/06*

U.S. Cl. 156—644 5 Claims

1. A process for etching via holes in an alumina layer comprising contacting selected areas of said layer with an etchant bath comprising an aqueous solution of ethylenediaminetetraacetic acid at a pH above 9.

4,619,732

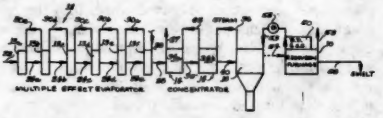
METHOD FOR DRYING PULPING LIQUOR TO A BURNABLE SOLID

David T. Clay, and Timothy B. Cartwright, both of Appleton, Wis., assignors to The Institute of Paper Chemistry, Appleton, Wis.

Continuation-in-part of Ser. No. 557,604, Dec. 2, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 759,085

Int. Cl.[4] D21C *11/00, 11/10*

U.S. Cl. 162—29 9 Claims



1. A method of preparing non-tacky pulping liquor solid particulates comprising

concentrating pulping liquor to between about 50 and about

75 weight percent solids, the balance being essentially all water,

providing a pressurized drying vessel having a region and containing a bed of pre-formed pulping liquor solid particulates within said region,

within said region, fludizing said bed of particulates with a gaseous medium stream, comprised of at least about 85% v/v superheated steam, balance non-interactive gases, said medium flowing upwards through said bed of particulates at a sufficient velocity to fluidize said particulates, said velocity being at least about 6.1 feet per second,

introducing said pulping liquor into said fluidized bed,

maintaining the temperature within said fluidized bed region at, at least, the boiling temperature of water from the pulping liquor at the pressure within said pressurized vessel, the temperature in said region not to exceed a maximum temperature of between about 375° F. to about 390° F., above which organic components of said pulping liquor tend to pyrolyze and not to drop below a minimum temperature of between about 245° F. and about 300° F., below which pulping liquor solid particulates aggregate in the presence of steam, the pressure in said vessel being between about 40 and about 70 psig, the temperature and pressure being such that water boils from said pulping liquor,

the major portion of the thermal energy for maintaining said temperature being provided by passing steam at such elevated temperatures and pressures through heat-exchange means within said pressurized region that the steam in said heat-exchange means condenses, releasing its latent heat as sensible heat that is transferred to said fluidized bed region, whereupon said gaseous medium vaporizes water from the pulping liquor with said region, creating additional solid particulates and substantially lowering superheat of said stream of gaseous medium,

said gaseous medium stream being introduced at a temperature at least about 10° F. higher than the temperature maintained within said fluidized bed,

continuously withdrawing solid particulates from said fluidized bed so as to maintain the size range of bed particulates at between about 0.5 and about 5.0 mm in diameter, the residence of black liquor in said fluidized bed being sufficient to produce particulates having less than about 10% water content,

withdrawing said lower superheat gaseous medium from said vessel,

directing a portion of said withdrawn medium through a superheater and recirculating the same as said fluidizing medium, and

utilizing another portion of said withdrawn medium in said concentrating step.

4,619,733

POLLUTION FREE PULPING PROCESS USING RECYCLED WASH EFFLUENT FROM MULTIPLE BLEACH STAGES TO REMOVE BLACK LIQUOR AND RECOVERING SODIUM HYDROXIDE FROM THE BLACK LIQUOR

Boon-Lam Kooi, 14429 Swallow Rue, Pierrefonds, Quebec H9H 1S6, Canada

Continuation of Ser. No. 556,381, Nov. 30, 1983, abandoned. This application Apr. 24, 1985, Ser. No. 725,506

Int. Cl.[4] D21C *9/147, 9/153, 9/16*

U.S. Cl. 162—30.1 **3 Claims**

1. A process for pulping lignocellulosic material comprising the steps of:

(a) subjecting the lignocellulosic material to a digestion stage in the presence of NaOH as active alkali compound charged at between 20 to 25% and anthraquinone charged at between 0.1 to 0.4% at a temperature of between 160° C. to 170° C. for a time period of between 120 to 150 minutes to have a final K number of 40 to 60.

(b) defiberizing the said pulp from step (a);

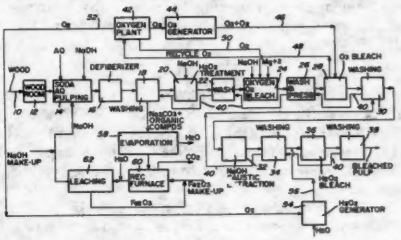
(c) washing the defiberized pulp from step (b) and sending black liquor removed by the washing to an evaporator;

(d) treating the washed pulp from step (c) with between 0.5 to 1.0% of hydrogen peroxide and 3 to 4% of sodium hydroxide for a period of between 60 to 90 minutes at a pulp consistency of between 15 to 25% to give a final K number of between 20 to 30 and subsequently washing the treated pulp;

(e) subjecting the washed pulp from step (d) to an oxygen bleaching with oxygen charged at between 0.2 to 3% with a pulp consistency of between 3 to 30% at a temperature of between 80° to 120° C. at a pH of between 9 to 12 for a time period of 10 to 60 minuted with a magnesium ion present at between 0.1 to 0.3% and NaOH present at between 3–7% and subsequently washing said pulp;

(f) further bleaching said pulp from step (e) in the presence of ozone at between 0.2 to 1% at a pulp consistency of between 1 to 40% for a time of between 5 to 300 minutes at a temperature of between 15° to 60° C. at a pH of between 2 to 7 and subsequently washing the pulp;

(g) subjecting said washed pulp from step (f) to a sodium



hydroxide extraction with sodium hydroxide being applied at between 1 to 3%, a pulp consistency of between 1 to 15%, a temperature of between 20° to 60° C., a pH of between 6 to 8 for a time period of between 70 to 90 minutes and subsequently washing the pulp;

(h) further bleaching said pulp from step (g) in the presence of hydrogen peroxide charged at between 0.2 to 2% at a pulp consistency of between 10 to 25% for a time period of between 10 to 300 minutes at a temperature of between 20° to 90° C. with a pH of between 7 to 11 and subsequently washing the pulp;

(i) the effluent from the washing of the said pulp in the above said steps (h), (g), (f) and (e) is counter-currently recycled to the said washing step in (c) and subsequently sent to the evaporator;

all percentages being based on oven-dried pulp, the process being further characterized in that the black liquor from the evaporator in step (c) is forwarded to a recovery furnace to recover sodium hydroxide which is then utilized in step (a), the oxygen from the ozone bleaching in step (f) being recycled and utilized in step (e) and the process being further characterized in being free of sulphur and chlorine.

4,619,734

SANITARY PAPER WEB HAVING HIGH BULK, BULK SOFTNESS AND SURFACE SOFTNESS AND METHOD OF MANUFACTURING SAID WEB

Ingmar A. Andersson, Hammarö , Sweden, assignor to KMW Aktiebolag, Karlstad, Sweden

PCT No. PCT/SE84/00339, § 371 Date Apr. 24, 1985, § 102(e) Date Apr. 24, 1985, PCT Pub. No. WO85/01761, PCT Pub. Date Apr. 25, 1985

PCT Filed Oct. 16, 1984, Ser. No. 727,246

Claims priority, application Sweden, Oct. 21, 1983, 8305797

Int. Cl.[4] D21H *5/24*

U.S. Cl. 162—111 **12 Claims**

1. A sanitary paper web having high bulk, bulk softness and

surface softness, and comprising a creped sanitary paper web and expanded microspheres of thermoplastic material incorporated therein in an amount from 1 to 10% based on the weight of the dry web, said web having a high bulk value of at least about 4.0×10^{-3} m^3/kg.

4,615,735

METHOD OF RETARDING PAPER DEGRADATION WITH TIME BY TREATMENT WITH MELAMINE, AND METHOD OF PRODUCING AGEING-RESISTANT PAPER COATED WITH MELAMINE

Richard V. Norton, Columbus, Ohio, assignor to Melamine Chemicals, Inc., Donaldsonville, La.

Filed Feb. 13, 1985, Ser. No. 701,153
Int. Cl.[4] D21H *1/28*
U.S. Cl. 162—135 9 Claims

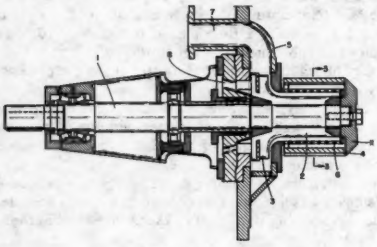
1. The method of treating existing paper products to retard degradation upon ageing over a prolonged time period comprising contacting existing paper with a super-critical solution of a melamine compound selected from the group consisting of melamine, ammeline, melam, melem, and mixtures thereof, to provide on said paper at least a superfical coating of said melamine compound, said coating being effective to retard the degradation of paper upon ageing over a prolonged time period.

4,619,736

APPARATUS FOR DEFIBERIZING, SCREENING AND PUMPING CELLULOSE PULP OR RECYCLED PAPER

Kaj O. Henricson, Kotka, and Pekka O. Peltola, Anjala, both of Finland, assignors to A. Ahlstrom Osakeyhtio, Noormarkku, Finland

Filed Jul. 3, 1984, Ser. No. 627,415
Claims priority, application Finland, Jul. 12, 1983, 832531
Int. Cl.[4] D21B *1/32*
U.S. Cl. 162—261 10 Claims



1. Apparatus for defiberizing, screening and pumping pulp or recycled paper, at a determined high consistency which comprises

a centrifugal pump having an inlet, an impeller and a defiberizing rotor disposed in said inlet in front of said impeller,

a screen member comprising a screen plate surrounding and disposed in front of the defiberizing rotor in the flow direction of the pulp for separating nondisintegrated material;

and defiberizing elements on the opposite side of said screen member from said defiberizing rotor for initially defiberizing said pulp or paper at said determined high consistency.

9. Apparatus for defiberizing, screening and pumping pulp or recycled paper, at a determined high consistency, said apparatus comprising

a centrifugal pump having an inlet, an impeller and a defiberizing rotor disposed in said inlet in front of said impeller

and a screen member surrounding and disposed in front of the defiberizing rotor in the flow direction of the pulp for separating nondisintegrated material;

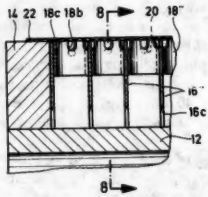
wherein said screen member comprises a plurality of stationary surfaces and a plurality of moving surfaces in operative proximity with said stationary surfaces and forming a plurality of screening slots therewith.

4,619,737

ROLLER FOR MACHINES IN THE PAPER-MAKING INDUSTRY

Emil Holz, Eningen, Fed. Rep. of Germany, assignor to Hermann Finckh Maschinenfabrik GmbH & Co., Fed. Rep. of Germany

Filed Sep. 6, 1985, Ser. No. 773,361
Claims priority, application European Pat. Off., Sep. 29, 1984, 84111680.9
Int. Cl.[4] D21F *1/60, 1/46*
U.S. Cl. 162—357 5 Claims



1. A roller for machines in the paper-making industry, said roller comprising a support tube, a plurality of bands attached to the support tube and extending at least approximately in the circumferential direction and standing upright in the radial direction, said bands including straight and corrugated band sections alternating with each other in the axial direction and connected one to another at connecting points, said corrugated band sections having recesses at their radially outer edges approximately in the center between the connectiong points, and a cover fabric forming the circumference of the roller and supported and resting directly on at least the radially outer edges of the corrugated band sections with passages provided between the cover fabric and the bands at the connecting points of the latter in the region of the radially outer edges of the corrugated band sections, said passages allowing a through flow in the circumferential direction.

4,619,738

APPARATUS FOR OIL SHALE RETORTING

Arthur E. Lewis, Los Altos; Robert L. Braun, Livermore; Richard G. Mallon, Livermore, and Otis R. Walton, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Division of Ser. No. 534,472, Sep. 21, 1983, abandoned. This application Aug. 2, 1984, Ser. No. 636,960
Int. Cl.[4] C10B *1/04*
U.S. Cl. 202—85 16 Claims

1. Apparatus for retorting oil shale particles of variable size, including fines, comprising:

a substantially vertical cascading burner having a pair of opposing walls;

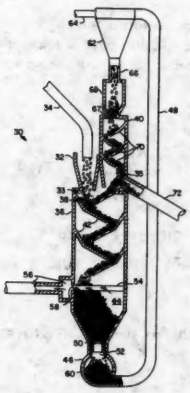
a plurality of vertically spaced baffles extending from the opposing walls of the burner inwardly and downwardly into the burner in an overlapping relationship, successive baffles extending alternately from opposing walls of the burner said baffles, comprise a first segment and a second segment connected to and above the first segment and having a slope greater than the first segment, wherein the first segment has a slope, measured from the horizontal, in the range of about 24°–60°;

a substantially vertical cascading mixer below the burner, the burner being mounted to the mixer and communicat-

ing therewith through an opening therebetween, the mixer having a pair of opposing walls;

a plurality of vertically spaced baffles extending from the opposing walls of the mixer inwardly and downwardly into the mixer in an overlapping relationship, successive baffles extending alternately from opposing walls of the mixer;

raw shale input means mounted to the top of the mixer adjacent to the burner and communicating with the mixer through an opening therebetween;



a substantially vertical moving packed bed pyrolyzer below the mixer, the mixer being mounted to and opening into the pyrolyzer;

spent shale removal means connected at the bottom of the pyrolyzer and communicating with the pyrolyzer through an opening therebetween; and

product removal means operatively connected to the pyrolyzer.

4,619,739

METHOD AND APPARATUS FOR MEASURING HALOGEN ION CONCENTRATION

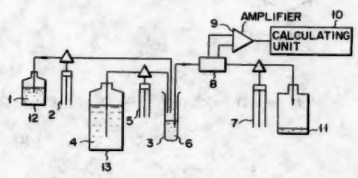
Ken-ichi Kanno; Tetsuya Gatayama; Masao Koyama, and Junji Koezuka, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jan. 2, 1986, Ser. No. 815,467

Claims priority, application Japan, Jan. 14, 1985, 60-4361; Jan. 14, 1985, 60-4362

Int. Cl.[4] G01N *27/28, 27/50*

U.S. Cl. 204—1 T **15 Claims**



1. A method for measuring a halogen ion concentration in a solution, comprising the steps of:

bringing halogen ion-selective detection means comprising a silver/silver halide electrode, and a reference electrode into a solution whose halogen ion concentration is to be measured; and

measuring an electromotive force of said halogen ion-selective detection means corresponding to the halogen ion concentration in the solution with the presence of silver ions predissolved in the solution.

11. An apparatus for measuring a halogen ion concentration in a solution, comprising:

an ion-selective electrode unit including a halogen ion-selective electrode comprising a silver/silver halide electrode;

a cell, having a flow path for the solution, for supporting said ion-selective electrode unit so as to expose it into said flow path;

means for introducing the solution into said flow path of said cell;

means for dissolving silver ions in the solution;

potential measurement means for measuring a potential of said ion-selective electrode unit when the solution in which the silver ions are dissolved is introduced into said flow path; and

means for calculating an ion concentration in the solution based on the potential measured by said potential measurement means.

4,619,740

METHOD OF MEASURING CURRENT DENSITY IN ELECTROPLATING BATHS

Detlev Nitsche, and Rolf Rolff, both of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Mar. 18, 1985, Ser. No. 713,266

Claims priority, application Fed. Rep. of Germany, Mar. 22, 1984, 3410875

Int. Cl.[4] C25D *5/02*

U.S. Cl. 204—15 **3 Claims**

1. In a method for measuring a current density in electroplating baths during a galvanizing process for electroplating printed circuit boards, the improvement comprising the steps of applying to a conductive area of an upper surface of a printed circuit board to be electroplated an isolated metallic island; and measuring the current density directly on the upper surface of the printed circuit board to be electroplated by measuring a voltage between the printed circuit board and said metallic island.

4,619,741

PROCESS FOR PREPARING A NON-CONDUCTIVE SUBSTRATE FOR ELECTROPLATING

Karl L. Minten, Cannock, United Kingdom, and Galina Pismennaya, Palisades Park, N.J., assignors to Olin Hunt Specialty Products Inc., Palisades Park, N.J.

Continuation-in-part of Ser. No. 721,964, Apr. 11, 1985, abandoned. This application Nov. 29, 1985, Ser. No. 802,892

Int. Cl.[4] C25D *5/02, 5/54*

U.S. Cl. 204—15 **22 Claims**

1. A process for electroplating a conductive metal layer to the surface of a non-conductive material which comprises:

(a) preparing a liquid dispersion of carbon black comprised of:

(1) carbon black particles having an average particle diameter of less than about 3.0 microns in said dispersion;

(2) an effective dispersing amount of a surfactant which is compatible with said carbon black; and

(3) liquid dispersing medium, wherein the amount of carbon black is sufficient to coat substantially all of said non-conducting surfaces and is less than about 4% by weight of said liquid dispersion;

(b) applying said liquid dispersion to the surface of the non-conducting material;

(c) separating substantially all of said liquid dispersing medium from said carbon black particles, whereby said particles are deposited on said non-conductive surface in a substantially continuous layer; and

(d) electroplating a substantially continuous conductive

metal layer over the deposited carbon black layer and said non-conductive surface.

4,619,742

PROCESS FOR THE SIMULTANEOUS GRAINING AND CHROMIUM-PLATING OF STEEL PLATES AS SUPPORTS FOR LITHOGRAPHIC APPLICATIONS

Engelbert Pliefke, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 3, 1985, Ser. No. 751,538

Claims priority, application Fed. Rep. of Germany, Jul. 4, 1984, 3424528

Int. Cl.[4] C25D *11/38, 5/36*

U.S. Cl. 204—34 14 Claims

1. A process for preparing a chromium-plated steel or steel-based substrate suitable for use as a lithographic printing plate support, comprising the steps of:

(A) plating said substrate with alternating current in an acid electrolyte bath containing chromium ions, chloride ions and sulfate ions with alternating current; and

(B) in the same electrolyte bath, carrying out an electrochemical treatment of said substrate with direct current.

4,619,743

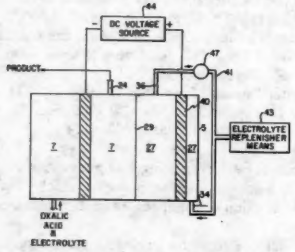
ELECTROLYTIC METHOD FOR REDUCING OXALIC ACID TO A PRODUCT

Ronald L. Cook, Aurora, Ill., assignor to Texaco Inc., White Plains, N.Y.

Filed Jul. 16, 1985, Ser. No. 755,528

Int. Cl.[4] C25B *3/04*

U.S. Cl. 204—77 6 Claims



1. A method for reducing oxalic acid to a product comprising the steps of:

separating a catholyte and an aqueous anolyte, having ammonium chloride, in a manner so that electrons can pass between them,

mixing oxalic acid with an aqueous electrolyte having ammonium chloride to provide the catholyte,

passiang the catholyte through a porous cathode having a catalyst,

passing the anolyte through a porous anode, and

providing a d.c. voltage across the cathode and the anode so as to cooperate in the reduction of the oxalic acid within the cathode to a product.

4,619,744

RECOVERY OF HEAVY METALS FROM AQUEOUS SOLUTIONS

Robert L. Horton, Tulsa, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 28, 1985, Ser. No. 791,883

Int. Cl.[4] C25C *1/00;* B01D *15/06, 11/04*

U.S. Cl. 204—105 R 12 Claims

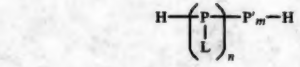
1. A process for the recovery of heavy metals selected from the group consisting of elements with atomic numbers

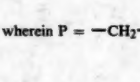
39-51,

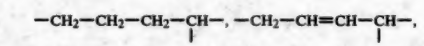
57-84, and

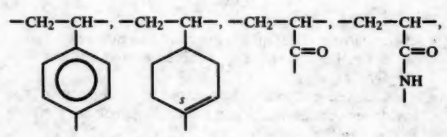
89-117 from aqueous solution which comprises

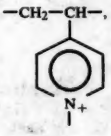
(a) contacting said solution with at least one soluble, cross-linkable polyelectrolyte having the structure:

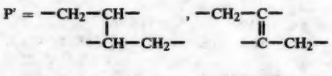


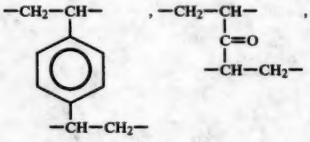
wherein P =  ,







P' =  ,

 ,

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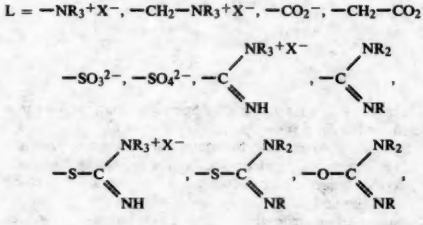
L = 

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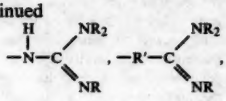


X = Cl, Br or I;

L^1 = any member of the group defined by L, with the proviso that for any given polymer $L \neq L^1$,

R = H or C_1–C_8 alkyl or aryl group; and

R′ = C_1–C_4 alkyl group,

n = 2 up to 10^6, and

m = 0 up to n, with the proviso that m is selected so that the resulting polymer is water soluble, under conditions suitable to cause crosslinking and precipitation of said polyelectrolyte, and

(b) recovering the precipitate produced in step (a).

4,619,745

PROCESS FOR THE ELECTROCHEMICAL DECONTAMINATION OF WATER POLLUTED BY PATHOGENIC GERMS WITH PEROXIDE FORMED IN SITU

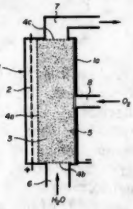
Augusto Porta, Carouge, and Antonin Kulhanek, Le Lignon, both of Switzerland, assignors to Battelle Memorial Institute, Carouge, Switzerland

Filed Oct. 10, 1984, Ser. No. 659,319

Claims priority, application Switzerland, Oct. 11, 1983, 5524/83

Int. Cl.⁴ C02F *1/46*

U.S. Cl. 204—151 **11 Claims**



1. A process for the decontamination of polluted water containing pathogenic germs as pollutants which comprises the following steps:

(a) providing an electrolytic cell which comprises:

(i) a housing;

(ii) an elongate anode made of inert material in said housing;

(iii) an elongate cathode of structurally porous carbon or graphite in said housing, freely permeable to water and extending parallel to said anode;

(iv) a source of direct current in electrochemical contact with said anode and said cathode; and

(v) a source of oxygen in contact with the polluted water to decontaminate the same;

(b) feeding oxygen into said housing at said cathode;

(c) passing the polluted water through the electrolytic cell and through said cathode parallel to said cathode and said anode, and in contact with both said cathode and said anode, while electrolyzing the polluted water to electrolytically reduce the oxygen at, and in contact with said cathode to hydroperoxide depollutant products, said products oxidizing said pathogenic germs to decontaminate the water; and

(d) withdrawing the decontaminated water from the electrolytic cell.

4,619,746

PROCESS FOR TOPCOATING AN ELECTROCOATED SUBSTRATE WITH A HIGH SOLIDS FLUID COATING

James M. Delaney, Blawnox, and Edward L. Jozwiak, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Oct. 2, 1985, Ser. No. 782,826

Int. Cl.⁴ C25D *13/06, 13/04*

U.S. Cl. 204—181.1 **13 Claims**

1. A method of applying a decorative or protective coating to a substrate, comprising:

(i) electrophoretically applying a basecoat on the substrate,

(ii) drying the substrate by baking over an effective temperature-time schedule to a stage short of complete cure so as to evaporate residual water and volatile material from the coating in order to effect reflow of said coating,

(iii) non-electrophoretically applying a thermosetting fluid, high solids topcoat comprising isocyanate curing agents,

(iv) curing the substrate by baking the same over a temperature-time schedule sufficient to effect complete cure.

4,619,747

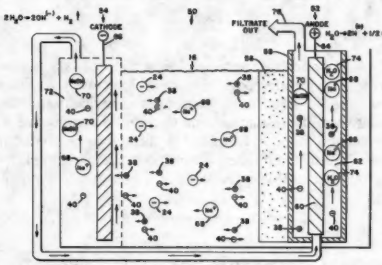
ELECTROFILTER PROCESS USING RECIRCULATING ELECTROLYTE

Jonathan K. Hoadley, Stamford, and Mark P. Freeman, deceased, late of Darien, both of Conn. (by Helen M. Freeman, executrix), assignors to Dorr-Oliver, Stamford, Conn.

Filed Apr. 3, 1985, Ser. No. 719,921

Int. Cl.⁴ B01D *13/02*

U.S. Cl. 204—182.3 **11 Claims**



1. A process for the dewatering or separation of particles in an aqueous suspension by means of an electrofilter, comprising the following steps:

a. submerging at least an anode assembly, said anode assembly comprising an anode, anolyte chamber and a membrane wall, and a cathode assembly, said cathode assembly comprising a cathode, catholyte chamber and a membrane wall, of said electrofilter into said aqueous suspension for the purpose of depositing a cake of said particles onto said anode assembly and withdrawing filtrate at said cathode assembly;

b. supplying an initial amount of electrolytic solution containing soluble compounds of an alkali metal or alkaline earth metal to said anolyte chamber of said anode assembly of the electrofilter, such that ions from the soluble compounds of alkali metal or alkaline earth metal are transported across the membrane or filter wall of said anode assembly and migrate through said aqueous suspension towards said cathode assembly;

c. transporting said alkali metal ions or alkaline metal earth ions, together with the filtrate from said aqueous suspension, through the membrane or filter wall of said cathode assembly into said catholyte chamber, such that said alkali metal ions or alkaline metal earth ions react with OH^-, produced at the cathode by a reaction between said filtrate and the cathode, to form a hydroxide solution; and

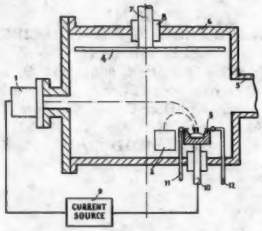
d. recirculating a solution comprising said filtrate and hydroxide solution from said cathode assembly to said anolyte chamber of the anode assembly; whereby said hydroxide solution breaks down at the anode to form alkali metal ions or alkaline earth metal ions and OH^- ions for neutralizing the reaction products at said anode.

4,619,748

METHOD AND APPARATUS FOR THE REACTIVE VAPOR DEPOSITION OF LAYERS OF OXIDES, NITRIDES, OXYNITRIDES AND CARBIDES ON A SUBSTRATE

Eberhard Moll, Schellenberg; Hans K. Pulker, Triesen, both of Liechtenstein, and Walter Haag, Buchs, Switzerland, assignors to Balzers Aktiengesellschaft, Liechtenstein

Filed Feb. 28, 1986, Ser. No. 834,757
Claims priority, application Switzerland, Mar. 1, 1985, 928/85
Int. Cl.[4] C23C *15/00*
U.S. Cl. 204—192.31 8 Claims



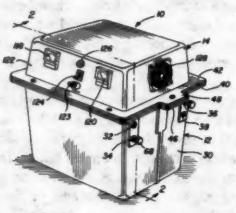
1. A method for the vapor deposition of layers of oxides, nitrides, oxynitrides, and carbides which comprises ion plating while the surface to be coated is electrically insulated or mounted on the insulation, and during the coating maintaining an electric plasma in front of the surface to be coated in such a way that the ion incidence density on the substrate is from 0.5 to 2 mA per cm^2 and the surface is charged to a potential of from -5 to -60 V.

4,619,749

SYSTEM FOR EXTRACTING SILVER FROM LIQUID SOLUTIONS

Ronald C. Nusbaum, 12651 Hillcrest Dr., Longmont, Colo. 80501

Filed Mar. 25, 1985, Ser. No. 715,377
Int. Cl.[4] C25C *7/00, 1/20*
U.S. Cl. 204—228 17 Claims



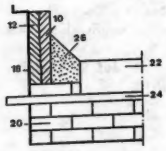
1. In combination with apparatus for recovering metal from a body of electrolytic liquid conducting plating current therethrough between at least two electrodes including current control means connected to one of the electrodes for changing said plating current supplied thereto from a voltage source, means connected in series with the other of the electrodes for establishing an electrode potential on the other of the electrodes dependent on resistance characteristics of the liquid, the improvement comprising voltage selection means connected to said source for selectively generating a reference threshold potential substantially equal to said electrode potential under a predetermined threshold condition of the liquid, detector means connected to said other of the electrodes and the voltage selection means for comparing the electrode potential with said reference threshold potential and means coupling the detector means to the current control means for prolonging recovery of metal by corrective change in the plating current in response to substantial matching of the potentials being compared by the detector means as the liquid approaches the predetermined threshold condition.

4,619,750

CATHODE POT FOR AN ALUMINUM ELECTROLYTIC CELL

Jean-Claude Bessard, deceased, late of Sierre, Switzerland (by Nadine Bessard, heir), assignor to Swiss Aluminium Ltd., Chippis, Switzerland

Filed Feb. 21, 1985, Ser. No. 704,086
Claims priority, application Switzerland, Mar. 2, 1984, 1042/84
Int. Cl.[4] C25C *3/08;* C25B *11/12*
U.S. Cl. 204—243 R 14 Claims



1. Cathode pot of a fused salt electrolytic cell for the production of aluminum in service containing a melt of aluminum and electrolyte which comprises an outer steel shell, a layer of insulation on the floor, carbon floor elements on said insulation, iron cathode bars surrounded by said carbon floor elements, prefabricated layered composite bodies lining the sides of the pot bonded to and forming a seal with the carbon floor elements, wherein the inner side of the said composite extends from the carbon floor elements along the sides of the pot and comprises essentially carbonaceous material and some fraction of binder and the outer side is spaced outwardly of said inner side and comprises essentially a hard, ceramic material which conducts electric current poorly, conducts heat well, is resistant towards attack by molten aluminum and the prevailing atmosphere and has a coefficient of thermal expansion comparable to that of carbon, and wherein the said sides are intimately bonded together having an intimately joined interface structure, and the composite is characterized by good flow of heat from inside to outside.

4,619,751

ANODE INSULATOR FOR ELECTROLYTIC CELL

Douglas J. Robinson, 8832 E. Holmes, Tucson, Ariz. 85710

Filed Apr. 24, 1985, Ser. No. 726,507
Int. Cl.[4] C25C *7/04*
U.S. Cl. 204—267 10 Claims

1. An improved anode insulator for use in an electrowinning cell, including a plurality of spaced anodes each supported by an anode header bar, each having a plurality of the improved anode insulators disposed thereon for preventing contact with a plurality of spaced cathodes that are respectively disposed between adjacent anodes, each improved anode insulator comprising:

(a) first and second elongated insulating means disposed

along intermediate portions of opposite faces of one of the anodes for preventing any contact between the faces of that anode and adjacent cathodes;

(b) upper connecting means disposed around the top and side portions of the anode header bar supporting that anode and conforming to the shape of the header bar; for preventing contact between the adjacent cathodes and that header bar, the upper connecting means being attached to upper end portions of the first and second elongated insulative means to support the first and second elongated insulating means, the upper connecting means also providing the function of guiding adjacent cathodes between adjacent anodes during lowering of the cathodes to their proper positions between the anodes, wherein the outer

surfaces of the upper connecting means do not extend substantially further outward from the anode header bar toward an adjacent anode header bar than the outer surface portions of the first and second elongated insulating means, whereby minimum anode to cathode spacing can be achieved; and

(c) lower connecting means for joining the lower end portions of the first and second elongated insulating means and preventing sideways displacement of the first and second elongated means in directions parallel to the faces of that anode, the first and second elongated insulating means being connected together at their end portions so that the first and second elongated insulating means, the upper connecting means, and the lower connecting means form a closed loop.

4,619,752

ELECTRODE FOR ELECTROLYTIC EXTRACTION OF METALS OR METAL OXIDES

Konrad Koziol, Röthenbach a.d. Pegnitz, and Erich Wenk, Nuremberg, both of Fed. Rep. of Germany, assignors to Conradty GmbH & Co. Metallelektroden KG, Röthenbach a.d. Pegnitz, Fed. Rep. of Germany

Filed Feb. 20, 1985, Ser. No. 703,548

Claims priority, application Fed. Rep. of Germany, Feb. 24, 1984, 3406777

Int. Cl.⁴ C25C *7/02*; H01R *43/00*

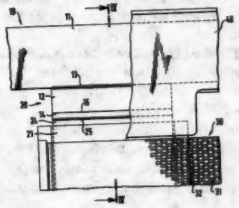
U.S. Cl. 204—286 **13 Claims**

1. An electrode for the electrolytic extraction of metals or metal compounds comprising:

a horizontal current feed having an electrically conductive rail;

at least one current distributor branching from said rail and comprising a sleeve of valve metal and a conductive metal core in electrical connection with said sleeve; an active part which is mechanically and electrically connected to said sleeve; and

a copper element connected to said rail and a connection



element of valve metal welded by means of explosion welding to said copper element, said connection element of valve metal further electrically and mechanically connected to said current distributor.

4,619,753

BIPOLAR PLATE FOR AN APPARATUS WITH A STACKED CONFIGURATION, SAID APPARATUS COMPRISED OF A PLURALITY OF ELECTROCHEMICAL CELLS WITH SOLID ELECTROLYTE; AND METHOD OF MANUFACTURING SAID PLATE

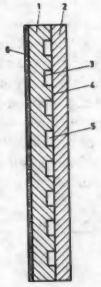
Hans-Jörg Christen, Untersiggenthal; Hubert Devantay, Neuenhof; Claude Schellenberg, Birmenstorf; Günther Scherer, Gebenstrof, and Samuel Stucki, Nussbaumen, all of Switzerland, assignors to BBC Brown, Boveri & Company Limited, Baden, Switzerland

Filed Jan. 18, 1985, Ser. No. 692,522

Claims priority, application Switzerland, Jan. 26, 1984, 354/84

Int. Cl.⁴ B65D *85/18*; H01M *4/88*

U.S. Cl. 204—290 F **4 Claims**



1. A bipolar plate for an apparatus having a stacked configuration comprised of a plurality of eletrochemical cells and employing a solid electrolyte, wherein at least one support comprised of porous titanium is provided which support serves as a current collector; characterized in that the support is comprised of a porous titanium plate having a parallel groove structure, which structure is welded on its face side to a non-porous, solid titanium plate at the plane loci of contact, whereby laterally closed, continuous channels are formed; and in that the side of the porous titanium plate which is directed away from the parallel groove structure is provided with a surface layer or coating comprised of a material which is a catalyst for electrolytic reactions.

4,619,754

CHEMICALLY MODIFIED ELECTRODES AND THEIR USES

Katsumi Niki; Katsuyoshi Kobayashi, both of Yokohama; Hiroo Inoguchi, Okazaki, and Tatsuhiko Yagi, Shizuoka, all of Japan, assignors to Ajinomoto Company Incorporated, Tokyo, Japan

Filed Mar. 8, 1983, Ser. No. 473,207
Claims priority, application Japan, Mar. 9, 1982, 57-36870
Int. Cl.[4] C25B 11/20
U.S. Cl. 204—290 R 10 Claims

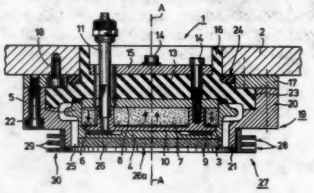
1. An electrically conducting solid electrode having a surface on which a monomeric nitrogen-containing electron mediator and a strong acidic cation exchange resin containing sulfonated, aromatic groups are immobilized.

4,619,755

SPUTTERING SYSTEM FOR CATHODE SPUTTERING APPARATUS

Gerhard Hessberger, Karlstein, and Michael Scherer, Rodenbach, both of Fed. Rep. of Germany, assignors to Hans Zapfe, Rodgau-3, Fed. Rep. of Germany

Filed Jul. 25, 1985, Ser. No. 759,026
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1984, 3427587
Int. Cl.[4] C23C 15/00
U.S. Cl. 204—298 5 Claims



1. Sputtering system for cathode sputtering apparatus, comprising: a cathode base body having a target with a sputtering surface of a material to be sputtered, a dark-space shield separated by an air gap from the cathode base body, and an anode disposed in the area of the margin of the target and having at least one groove opening in a side of the anode that is not in the line of sight of the target, the anode (27) being disposed on the margin of the dark-space shield (19) and side walls of the at least one groove (28) thereof being aligned substantially parallel to the sputtering surface (26a) of the target (26).

4,619,756

METHOD TO INHIBIT DEPOSIT FORMATION

Ghazi B. Dickakian, Kingwood, Tex., assignor to Exxon Chemical Patents Inc., Florham Park, N.J.

Continuation of Ser. No. 722,865, Apr. 11, 1985, abandoned. This application Oct. 11, 1985, Ser. No. 786,929
Int. Cl.[4] C10G 9/16
U.S. Cl. 208—48 AA 20 Claims

1. A process for inhibiting deposit formation on the contact surfaces of structures confining heated hydrocarbon fluid which exhibits substantial fouling comprising the step of introducing into said hydrocarbon fluid at least an inhibiting amount of thiophene-containing polycondensed aromatic/-naphthenic compounds of number average molecular weight ($\overline{Mn}$) from 200 to 1,000.

4,619,757

TWO STAGE HYDROTREATING PRETREATMENT IN PRODUCTION OF OLEFINS FROM HEAVY HYDROCARBONS

Heinz Zimmermann, Munich, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 546,354, Oct. 28, 1983, abandoned, which is a continuation-in-part of Ser. No. 527,952, Aug. 31, 1983, abandoned. This application Dec. 19, 1984, Ser. No. 683,764
Claims priority, application Fed. Rep. of Germany, Aug. 31, 1982, 3232395
Int. Cl.[4] C10G 65/08, 69/06
U.S. Cl. 208—57 28 Claims

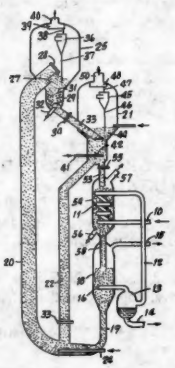
21. In a process for hydrotreating heavy hydrocarbons, the improvement which comprises conducting the hydrotreating in two stages with two different hydrotreating catalysts, and with two different starting hydrocacrbon fractions, wherein the first stage a first starting hydrocarbon fraction high in polyaromatic compounds is selectively degraded to form a product reduced in polyaromatic compounds, and in the second stage, said product is refined in admixture with a low viscosity, non-hydrogenated second starting hydrocarbon fraction low in polyaromatic substances to remove sulfur, sulfur compounds and N-bases therefrom, the hydrotreating catalyst in the first stage being a zeolitic catalyst and the hydrotreating catalyst in the second stage being a non-zeolitic catalyst, wherein said first starting hydrocarbon fraction high in polyaromatics has a viscosity of 20–40 centistokes, and after the hydrogenation in the first stage a viscosity of about 5–15 centistokes, and the fraction low in polyaromatics has a viscosity of about 1–5 centistokes, with the differential viscosity between the fraction low in polyaromatics and the hydrogenated high in polyaromatics fraction being about at least 5 centistokes, all viscosities being measured at 50° C.

4,619,758

FLUID CATALYTIC CRACKING METHOD

Roy E. Pratt, Port Neches; Scott M. Sayles, Nederland, both of Tex.; Kerry W. Bowers, Birmingham, Ala., and Richard P. Scott, deceased, late of Groves, Tex. (by Candice C. Scott, executrix), assignors to Texaco, Inc., White Plains, N.Y.

Continuation of Ser. No. 396,564, Jul. 9, 1982, abandoned. This application Apr. 24, 1984, Ser. No. 602,632
Int. Cl.[4] C10G 11/18, 25/09
U.S. Cl. 208—85 17 Claims



1. A process for the production of lower molecular weight hydrocarbons including normally gaseous olefins from a liquid hydrocarbon charge stock comprising both paraffinic and non-paraffinic components which comprises contacting vaporized hydrocarbon charge stock having a subatmospheric va-

porization temperature in the range of 260° to 400° C. comprising both paraffinic and non-paraffinic components with a cracking catalyst comprising an alumino silicate zeolite molecular sieve in an amorphous silica-alumina matrix at a temperature in the range of 300° to 400° C. and at subatmospheric pressure effecting selective adsorption of paraffinic hydrocarbons and loading the zeolite molecular sieve in said catalyst with paraffinic hydrocarbons, separating catalyst comprising said molecular sieve loaded with adsorbed paraffinic hydrocarbons from said mixture of hydrocarbons, subjecting said catalyst comprising said loaded molecular sieve to a cracking reaction temperature in the range of 650° to 700° C. for a period of time in the range of 0.1 to 2 seconds effecting cracking of said paraffins, and separating products of reaction comprising normally gaseous olefins from said cracking catalyst.

4,619,759

TWO-STAGE HYDROTREATING OF A MIXTURE OF RESID AND LIGHT CYCLE OIL

John W. Myers; Stephen L. Parrott, and Edward L. Sughrue, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 24, 1985, Ser. No. 726,760
Int. Cl.[4] C10G *65/04*
U.S. Cl. 208—210 **12 Claims**

1. A process for the catalytic hydrotreating of a feed stream comprising a mixture of a resid and a light cycle oil comprising the steps of:

contacting said feedstream in the absence of a catalyst primarily designed for hydrocracking under suitable hydrotreating conditions with at least one first catalyst composition which comprises alumina and an amount of cobalt and molybdenum that promotes hydrotreating; and

then contacting said thus treated feedstream under suitable hydrotreating conditions with at least one second catalyst composition comprising alumina and an amount of molybdenum and nickel that promotes hydrotreating wherein the total amount of nickel plus molybdenum of the at least one second catalyst composition exceeds the total amount of cobalt plus molybdenum of the at least one first catalyst composition thereby producing a product stream having an improved cetane index.

4,619,760

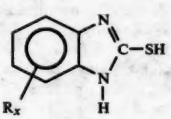
ORE FLOTATION AGENT FROM 2-MERCAPTOBENZIMIDAZOLE AND FLOTATION PROCESSES THEREWITH

Kenneth B. Kimble; Clarence R. Bresson, and Harold W. Mark, all of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 2, 1985, Ser. No. 729,770
Int. Cl.[4] B03D *1/14*; C09K *3/00*
U.S. Cl. 209—166 **13 Claims**

1. A process for producing a nitrogen- and sulfur-containing aromatic ore flotation collector which comprises:

(a) reacting an alkali metal hydroxide with a 2-mercaptobenzimidazole having the formula:



wherein R is a C_1–C_6 carbon radical and x is 0–4, inclusive, then thereafter

(b) reacting the production of (a) with carbon disulfide under conditions suitable to form said nitrogen and sulfur-containing aromatic ore flotation collector, and

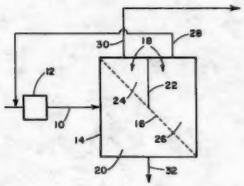
(c) recovering the solid reaction mass produced in (b) as the product of the process.

4,619,761

METHOD FOR SCREENING OR FRACTIONATION

Rune G. Franzen, Williamsport, Pa., assignor to Koppers Company, Inc., Pittsburgh, Pa.

Filed Dec. 20, 1984, Ser. No. 683,820
Int. Cl.[4] B07B *1/00, 1/04*; D21C *9/08*
U.S. Cl. 209—250 **15 Claims**



1. A method for at least partially separating a first class of particles from a second class of particles, said first class of particles being larger in at least one dimension than said second class of particles, comprising the steps of:

(a) entraining said first and second classes of particles in a first process fluid stream and then introducing said first process fluid stream into a primary chamber of a housing interiorly divided by a screening means into said primary chamber and a secondary chamber with said secondary chamber itself being divided into a recirculation section and an output section by an interior wall extending between about the screen member to about the housing such that each of said sections are at least partially bounded by the screening means

(b) within said housing, separating a second and a third process fluid stream from said first process fluid stream, said second process fluid stream flowing through the screening means into the output section of the secondary chamber of the housing and said third process fluid stream flowing through the screening means into the recirculating chamber of said secondary chamber, such that said second and third process fluid steams contain a lower proportion of said first class of particles as compared to said second class of particles than does said first process fluid stream;

(c) discharging the portion of the first process fluid stream not passing through the screening means from the primary chamber through the housing and discharging said second process fluid stream through said housing from the output section of the secondary chamber; and

(d) recirculating said third process fluid stream from the recirculation section of the primary chamber to the first process fluid stream.

4,619,762

DEVICES FOR RECOVERING POLYMETAL COMPOUNDS DISCHARGED FROM A SUBMARINE HYDROTHERMAL SOURCE

Jacques Delacour, Paris; Emile Levallois, Courbevoie; Patrick Antier, Niort, and Francois-Xavier Saint Martin, Epinal, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Division of Ser. No. 451,674, Dec. 21, 1982, Pat. No. 4,533,526.
This application May 7, 1985, Ser. No. 731,225
Claims priority, application France, Dec. 21, 1981, 81 24049
Int. Cl.[4] E02B *23/00*
U.S. Cl. 210—170 **14 Claims**

1. Apparatus for collecting, at a collection location, polymetal compounds discharged from an underwater source of hydrothermal fluid, the apparatus comprising:

a collector member for surrounding and fitting over the hydrothermal source;

an underwater concentrating unit for increasing the concentration of polymetal compounds in the hydrothermal fluid

to enrich the hydrothermal fluid with polymetal compounds, the concentrating unit being mounted above the collector member and in communication therewith, and

a conveying duct in communication with and extending above the concentrating unit for conveying the hydrothermal fluid, enriched with polymetal compounds to the collection location.

4,619,763

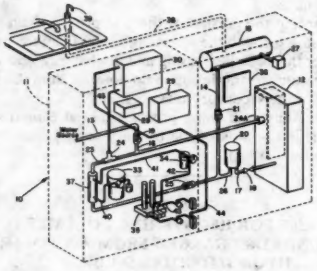
OZONE H_2O TREATMENT

Edward J. O'Brien, 251-5th Street NW., New Brighton, Minn. 55112

Continuation-in-part of Ser. No. 515,594, Jul. 21, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,594

Int. Cl.[4] C02F *1/78*; B01J *19/08*

U.S. Cl. 210—177 **5 Claims**



1. In a water purification system wherein water to be purified is contacted with ozone-enriched atmosphere, and including a source of water under pressure, supply conduit means, a chamber communicating with said source through said supply conduit means for receiving water under pressure, recirculation conduit means having both of its ends in fluid communication with said chamber, a source of ozone, and means for introducing ozone-enriched atmosphere into the water along said recirculation conduit means, said water purification system being characterized in that:

(a) said recirculation conduit means includes a venturi interposed therealong having an injection port for introducing ozoneenriched atmosphere from said ozone source into water passing along said conduit between said source and said chamber;

(b) said ozone source comprises a generally cylindrical shell forming a first electrode enclosing a second electrode in the form of a generally co-axially disposed tube, said shell and tube defining an annular corona generating zone between the inner surface of said shell and the outer surface of said tube, means defining an inlet and an outlet for passing ambient air into said zone, through said zone, and through said outlet to said injector port of said venturi and means defining a water inlet and a water outlet in fluid communication with said tube for allowing passage of a coolant through said tube;

(c) means for chilling and thereafter drying the ambient air prior to its being passed through said ozone generator; and

(d) means for re-circulating water from said chamber through said conduit means and venturi for introducing the ozone-enriched atmosphere from said ozone source into water passing along said conduit on repeated passes from said chamber, and for return to said chamber/; and/.

4,619,764

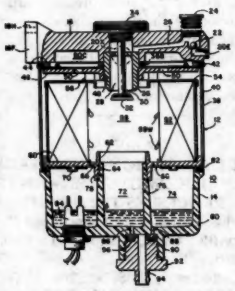
REPELLING-ACTION FILTER UNIT AND ASSEMBLY

John F. Church; Walter H. Stone, and Richard E. Schaupp, all of Modesto, Calif., assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Jun. 19, 1984, Ser. No. 622,163

Int. Cl.[4] B01D *27/08*

U.S. Cl. 210—248 **28 Claims**



19. An invention comprising a water repelling-action filter unit including:

(a) a cylindrical body having a fuel inlet port and fuel outlet port, and first and second contaminant outlets disposed on a first side of said body, both said first and second contaminant outlets directly communicating with a common chamber within said body;

(b) a water repelling-action filter media disposed in a closed loop within said body and around said chamber; and

(c) mating threads on said first side of said body for mating with threads on a contaminant collection bowl and a cylindrical portion at said first side of said body, said first contaminant outlet within said cylindrical portion and said second contaminant outlet outside of said cylindrical portion; and

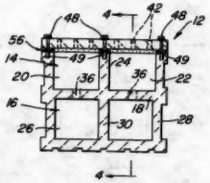
wherein said filter unit is operative to support a contaminant collection bowl with separate first and second contaminant collection zones disposed respectively beneath said first and second contaminant outlets.

4,619,765

FILTER BOTTOM CONSTRUCTION

Robert L. Roberts, Boothwyn, Pa., assignor to Roberts Filter Manufacturing Company, Darby, Pa.

Filed Oct. 10, 1984, Ser. No. 659,375
Int. Cl.[4] B01D *23/18*
U.S. Cl. 210—289 8 Claims



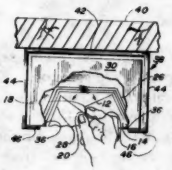
1. A filter block used in the construction of a multi-block filter bottom on which filter media is supported, wherein a plurality of filter blocks are disposed in parallel adjacent rows extending between side walls of a filter and with the blocks placed end-to-end within each row, said filter block including upper and lower lateral sections extending between end walls of said block and being divided by a horizontal partition, means defining ports through said partition for communicating the upper and lower lateral sections with each other, a removable top wall section above which the filter media is retained, said top wall section having passage means therethrough for communicating with the upper lateral section and fastening means for removably securing the top wall section to the remainder of the block.

4,619,766

BEVERAGE BREWINGS FILTERS, APPARATUS AND METHOD

Thomas B. Smiley, and Christine L. Smiley, both of 5508 Doncaster Way, Edina, Minn. 55436

Continuation of Ser. No. 602,936, Apr. 23, 1984, abandoned. This application Sep. 27, 1985, Ser. No. 780,250
Int. Cl.[4] B01D *23/28*
U.S. Cl. 210—482 14 Claims



1. In a disposable beverage brewing filter of the type including a bowl-like shaped sheet of porous material having a flat bottom wall and a surrounding corrugated side wall defining an open end for receiving coffee, tea or the like to be brewed, the improvement comprising:

the bottom wall of said sheet including a fold therein of predetermined, non-interlocking configuration with opposing generally parallel flap portions extending across the bottom wall to define a transverse integral strip to facilitate manual separation and removal of individual filters from a nested stack thereof.

4,619,767

COMPOSITE SEMIPERMEABLE MEMBRANE

Yoshiyasu Kamiyama; Noriaki Yoshioka, and Keisuke Nakagome, all of Osaka, Japan, assignors to Nitto Electric Industrial Co., Ltd., Osaka, Japan

Filed Jul. 28, 1981, Ser. No. 287,653
Claims priority, application Japan, Jul. 28, 1980, 55-103291
Int. Cl.[4] B01D *13/00*
U.S. Cl. 210—490 10 Claims

1. A composite semipermeable membrane comprising (1) a porous substrate, (2) an ultrathin film as a surface layer formed by polymerization by crosslinking of polyvinyl alcohol and an amino compound having at least two secondary amino groups using a polyfunctional crosslinking reagent capable of reacting with secondary amino groups and hydroxyl groups, and (3) a porous inner layer composed of water-insoluble polyvinyl alcohol which is present between the porous substrate and the ultrathin layer.

4,619,768

METHOD OF REMOVING CRUDE OIL SLUDGE

Sankichi Takahashi; Harumi Matsuzaki; Toshimi Mukushi, all of Hitachi; Katsuya Ebara, Mito; Tsunehiko Takakusagi, Hitachi; Masahiro Yoshida, Hitachi; Joshiro Sato, Hitachi; Yasumasa Yamane, Mito; Katsumi Sakaguchi, Hitachi, and Akira Watanabe, Abiko, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jun. 20, 1984, Ser. No. 622,463
Claims priority, application Japan, Jun. 22, 1983, 58-110810
Int. Cl.[4] B01D *17/12, 21/02, 21/26*
U.S. Cl. 210—739 6 Claims

1. A method of removing crude oil sludge from crude oil, wherein the crude oil contains fine sludge grains, small sludge grains and coarse sludge grains comprising:

(a) supplying the crude oil to a sedimentation tank;

(b) removing, after about three days, coarse grains which settle from the crude oil within about three days from the bottom of the tank and a crude oil supernatant from the top of the tank;

(c) supplying the supernatant to a filtration apparatus to remove the small sludge grains;

(d) transferring the filtered crude oil to a reservoir; and

(e) after the filtered crude oil is transferred to said reservoir and after a predetermined period of time, detecting the condition of crude oil sludge settled in said reservoir, dispersing said settled sludge by stirring the crude oil, and removing the crude oil containing the suspended sludge from the reservoir, wherein the detection of the condition of the crude oil sludge is performed by scanning at least the surface of the bottom of the reservoir with one of a sonar wave and a microwave and by detecting information of a reflective wave.

4,619,769

PROCESS FOR REGENERATING MEDIA FILTERS USED TO FILTER GEOTHERMAL BRINE

Gregory A. Gritters, Indio, and Jose M. Perez, Calexico, both of Calif., assignors to Union Oil Co. of California, Los Angeles; Mono Power Co., Rosemead and Southern Pacific Land Co., San Francisco, all of, Calif.

Filed Dec. 28, 1984, Ser. No. 687,199
Int. Cl.[4] B01D *23/24*
U.S. Cl. 210—747 23 Claims

1. A process for regenerating media filters used for filtering geothermal brine, the filter regenerating process comprising:

(a) flowing steam through said filter in a backflush direction, so as to cause agitation of the filter media; and

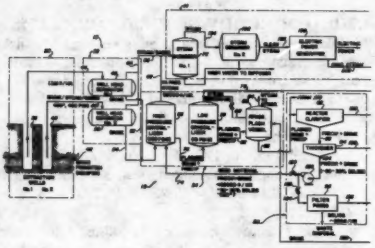
(b) flushing out said filter by flowing geothermal brine through said filter in the backflush direction.

19. In a geothermal brine handling facility for obtaining steam from a flow of naturally pressurized, silica-rich geothermal brine, said facility having a flashing stage in which the

brine is flashed to a lower pressure to convert some of the brine to steam, the brine becoming thereby supersaturated with silica, said facility further having a crystallization stage in which the flashed brine is contacted with seed material so as to cause silica precipitating from the brine to crystallize onto said seed material, having a clarification stage wherein the crystallized silica is separated from the brine to produce a clarified brine and having one or more media filters through which the clarified brine is flowed in a filtering direction so as to remove fine silica particles from the clarified brine, a process for regenerating said media filters, said process comprising:

(a) stopping the filtering flow of the clarified brine through one or more selected media filters and draining at least some of the brine therefrom;

(b) flowing through the selected filter in a reverse, backflush direction, steam converted from the geothermal brine in the flashing stage, so as to agitate the filter media and break up and loosen agglomerations of filtered material



entrapped in the filter media, the steam flow rate being between about 2 SCFM and about 10 SCFM per square foot of filter cross sectional area in the region of the filter media, the duration of the steam flow being at least about 5 minutes after quenching of the steam by the filter media and any remaining entrapped brine;

(c) flowing, after the flow of steam has stopped, through the selected filter, in the backflush direction, previously filtered brine, so as to flush out of the media the filtered material broken up and loosened by the preceding steam flow, and, when the media filters are comprised of two or more different media, to stratify the media layers, the brine flow rate being between about 15 gpm and about 30 gpm per square foot of filter cross-sectional area in the region of the filter media, the duration of said brine flow being at least about 5 minutes; and

(d) combining for disposal, the flow of backflush brine discharged from the selected filter with the flashed geothermal brine in the flashing stage.

4,619,770

METHOD AND APPARATUS FOR RECOVERING A FLUID FROM A FILTER

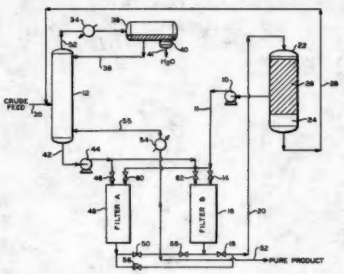
Ernest B. Boston, Phillips, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 7, 1985, Ser. No. 689,534
Int. Cl.[4] B01D *11/00*
U.S. Cl. 210—772 **17 Claims**

1. A method of recovering a first fluid, comprising sulfolane, from a filter in which it is trapped as a filtrate, comprising the steps of:

(a) washing the filter by passing an aliphatic hydrocarbon wash fluid in the molecular weight range of about C_5 to about C_{16} through the filter, the wash fluid and first fluid being substantially insoluble in each other and of different densities, wherein a first mixture containing wash fluid and first fluid results from said washing; and

(b) phase separating the first mixture into at least two phases in a phase separator, wherein a first phase substantially



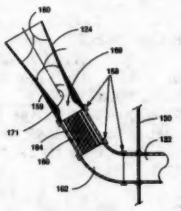
comprises first fluid, and wherein a second phase substantially comprises wash fluid.

4,619,771

TECHNIQUE FOR INCREASED RETENTION TIME IN OIL FIELD SETTLING TANKS

Joe C. Stall; Steven L. Andrews, both of Tulsa, and Donald D. Curnutt, Broken Arrow, all of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Continuation of Ser. No. 399,639, Jul. 19, 1982, abandoned, which is a continuation of Ser. No. 200,840, Oct. 27, 1980, abandoned. This application Dec. 13, 1984, Ser. No. 681,168
Int. Cl.[4] B01D *21/24*
U.S. Cl. 210—788 **12 Claims**



9. A process for continuous gravity separation of an oil-water mixture comprising the steps of:

discharging said oil-water mixture into a settling tank in a direction and at a velocity sufficient to direct the flow of the contents of said settling tank substantially tangential to the walls of said settling tank by introducing said oil-water mixture into said settling tank through an oil-water inlet pipe entering said settling tank substantially perpendicular to the wall of said settling tank at the point of entry of said pipe into said settling tank, bending the flow direction of said oil-water mixture to be introduced into said settling tank substantially tangential to said settling tank walls and reducing the velocity of said flow of said oil-water mixture after said bending by passing said oil-water mixture through a diffuser means;

withdrawing water from a lower portion of the interior of said settling tank; and

withdrawing oil from an upper portion of the interior of said settling tank.

4,619,772

METHOD AND MATERIAL FOR INCREASING VISCOSITY AND CONTROLLING OF OIL WELL DRILLING AND WORK-OVER FLUIDS

James K. Black, 2114 12th Ave. W., and Wesley F. Black, 2615 19th Ave. W., both of Williston, N. Dak. 58801

Filed May 23, 1982, Ser. No. 497,210
Int. Cl.[4] C09K 7/02
U.S. Cl. 252—8.514 11 Claims

1. Oil well drilling fluid produced by the process of mixing water and a viscosifier and colloidal water loss material, wherein said viscosifier and colloidal water loss material is comprised essentially of the outer layer of the endosperm portion of durum kernels that constitutes approximately 10 to 15 percent of the kernel by weight, and heating the mixture to a temperature of at least 175° to 180° F. (79° to 82° C.).

4,619,773

HIGH TEMPERATURE STABLE AQUEOUS BRINE FLUIDS VISCOSIFIED BY WATER-SOLUBLE COPOLYMERS OF ACRYLAMIDOMETHYLPROPANESULFONIC ACID SALTS

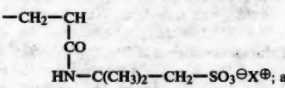
Israel J. Heilweil, Princeton, and Dennis H. Hoskin, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 490,623, May 2, 1983. This application May 6, 1985, Ser. No. 731,051
Int. Cl.[4] C09K 7/02
U.S. Cl. 252—8.514 26 Claims

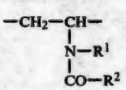
1. An aqueous brine fluid comprising:

(i) a viscosity increasing amount of one or more water-soluble copolymers of acrylamidomethylpropanesulfonic acid salts, consisting essentially of a random distribution of

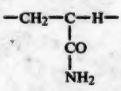
(a) 5 to 95% by weight of units of the formula



(b) 5 to 95% by weight of units of the formula



(c) 0 to 80% by weight of units of the formula



wherein R^1 and R^2 are the same or different and each is hydrogen, methyl or ethyl; and $X^{\oplus}$ is a cation; and

(ii) a densifying amount of a densifying salt sufficient to densify said fluid, said densifying salt constituting at least about 30% by weight of said fluid.

4,619,774

FABRIC SOFTENING HEAVY DUTY LIQUID DETERGENT AND PROCESS FOR MANUFACTURE THEREOF

Pallassana N. Ramachandran, Robbinsville, and Paul S. Grand, Highland Park, both of N.J., assignors to Colgate Palmolive Co., New York, N.Y.

Continuation of Ser. No. 449,261, Dec. 13, 1982, Pat. No. 4,469,605. This application Sep. 4, 1984, Ser. No. 646,983
The portion of the term of this patent subsequent to Sep. 4, 2001, has been disclaimed.
Int. Cl.[4] C11D 3/12; D06M 13/24
U.S. Cl. 252—8.7 6 Claims

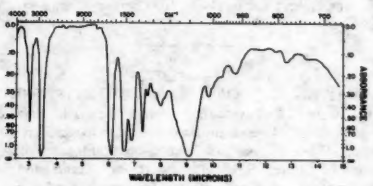
1. A fabric softening heavy duty liquid detergent comprising 5 to 15% of alkali metal linear or branched higher alkylbenzene sulfonate wherein the higher alkyl is of 12 to 13 carbon atoms, 2 to 5% of alkali metal alkyl polyethoxy sulfate wherein the alkyl is of 10 to 18 carbon atoms and the polyethoxy is of 3 to 11 ethylene oxide groups, 6 to 26% of builder salt selected from the group consisting of alkali metal tripolyphosphate, alkali metal carbonate, alkali metal nitrilotriacetate, and alkali metal citrate, and mixtures thereof, 10 to 20% of a swelling bentonite, and 40 to 75% of water.

4,619,775

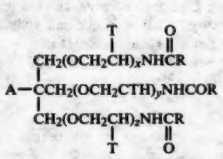
ANTISTATIC AGENTS WHICH ARE MULTIAMIDES OF TRIALKYLACETIC ACIDS AND MULTIAMINES

Robert J. Steltenkamp, Somerset, and Michael A. Camara, Jackson, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed May 16, 1985, Ser. No. 734,508
Int. Cl.[4] D06M 3/30
U.S. Cl. 252—8.8 22 Claims



1. Polyamides of trialkylacetic acid(s) and polyamine(s), which are diamides and/or triamides and which are useful as antistatic agents for filamentary and fibrous materials, wherein the alkyls of the trialkylacetic acid moieties are each of 1 to 10 carbon atoms and the sum of the carbon atoms in the alkyls of each of the triakylacetic acid moieties is from 3 to 12, and the polyamine moieties are diamine and/or triamine moieties with alkylene group(s) of 2 to 10 carbon atoms and/or polyoxyalkylene alkylene groups connecting the amide groups of the polyamide, with the oxyalkylene of the polyoxyalkylene groups being of 2 to 4 carbon atoms, with the number of such groups in each polyoxyalkylene group being from 1 to 40, and with the alkylene groups of the polyoxyalkylene alkylene being of 1 to 10 carbon atoms, which are selected from the group consisting of



and

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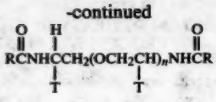


wherein A is selected from the group consisting of alkyl of 1 to 20 carbon atoms and hydrogen. T is selected from the group consisting of methyl and hydrogen, R is a neoalkyl of to 13 carbon atoms, n is from 1 to 40, and x, y and z are each numerals from 1 to 8, and total from 4 to 10.

4,619,776

CROSSLINKED FRACTURING FLUIDS

Thomas C. Mondshine, Houston, Tex., assignor to Texas United Chemical Corp., Houston, Tex.

PCT No. PCT/US85/01269, § 371 Date Aug. 9, 1985, § 102(e) Date Aug. 9, 1985
PCT Filed Jul. 2, 1985, Ser. No. 763,630
Int. Cl.[4] E21B *43/26*
U.S. Cl. 252—8.551 15 Claims

1. A method of preparing a fracturing fluid of enhanced temperature stability comprising hydrating in an aqueous liquid having a pH in the range from about 4.0 to about 8.0 a hydrophilic polymer containing at least two hydroxyl groups positioned in the cis-form on adjacent carbon atoms or on carbon atoms in a 1,3 relationship, adding to said aqueous liquid a sparingly soluble borate in an amount sufficient to provide sufficient boron to crosslink said polymer and to increase the thermal stability of said fracturing fluid, said sparingly soluble borate having at least five boron atoms per molecule and being selected from the group consisting of alkaline earth metal borates, alkali metal alkaline earth metal borates, and mixtures thereof, and controlling the time for crosslinking to occur by providing a pH of said aqueous liquid within the range from about 4.0 to about 10.0 before adding said borate thereto.

4,619,777

PREPARATION OF A MAGNETIC DISPERSION

Milena Melzer, Ludwigshafen; Helmut Jakusch, Frankenthal; Werner Graü, Bobenheim-Roxheim; Eberhard Köster, Frankenthal; Werner Löser, Ludwigshafen; Reinhard Polke, Mutterstadt; Günter Schädel, Mannheim; Manfred Ohlinger, Frankenthal, and Günter Väth, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 5, 1983, Ser. No. 491,718
Claims priority, application Fed. Rep. of Germany, May 7, 1982, 3217099
Int. Cl.[4] H01F *1/26;* C04B *35/04*
U.S. Cl. 252—62.54 8 Claims

1. A process for the preparation of a magnetic dispersion for magnetic recording media, in which a magnetically anisotropic material is dispersed in a polymer binder and in an organic solvent wherein the magnetically anisotropic material is worked in a jet mill by means of a jet of gas resulting in the jet milled magnetically anisotropic material being of a dry nature.

4,619,778

HEAT STORAGE MATERIALS

Christine D. Chalk, Buckinghamshire, and Cecil Hayman, Rickmansworth, both of United Kingdom, assignors to IC Gas International Limited, London, England

Continuation of Ser. No. 623,294, Jun. 22, 1984, abandoned.
This application Jun. 19, 1985, Ser. No. 746,020
Int. Cl.[4] C09K *5/06*
U.S. Cl. 252—70 9 Claims

1. A heat storage material which comprises at least one hydrated compound which undergoes reversible transformation to an anhydrous or less hydrated form, and at least one fusion temperature-depressing salt, said compound and said salt being dispersed and suspended throughout a water-swollen cross-linked synthetic polymer hydrogel, in which the total amount of salt is 50 to 75% by weight of the eutectic amount.

4,619,779

DETERGENT ADDITIVE PRODUCT

Frederick E. Hardy, Gosforth, England, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 508,763, Jun. 28, 1983, abandoned.
This application Dec. 12, 1984, Ser. No. 680,609
Claims priority, application United Kingdom, Jun. 30, 1982, 8218867
Int. Cl.[4] C11D *17/00*
U.S. Cl. 252—91 18 Claims

1. A detergent additive product consisting essentially of

(a) a peroxyacid bleach precursor having the general formula

wherein R is an alkyl group containing from about 5 to about 18 carbon atoms wherein the longest portion of the linear alkyl chain extending from and including the carbonyl carbon contains from about 6 to about 10 carbon atoms, and L is a leaving group the conjugate acid of which has a pKa in the range from about 6 to about 13, said peroxy bleach precuror being in water-releasable combination with

(b) a non-particulate flexible substrate, the weight ratio of the precursor to the substrate being in the range from about 30:1 to about 1:10;

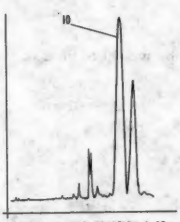
and wherein said peroxyacid bleach precursor is a particulate having particle size of less than 180 microns.

4,619,780

ETHER CARBINOLS, PROCESS FOR PREPARING SAME, PRODUCTS PRODUCED ACCORDING TO SAID PROCESSES CONTAINING SAID ETHER CARBINOLS, ORGANOLEPTIC USES THEREOF, ETHER CARBOXALDEHYDES AND ORGANOLEPTIC USES THEREOF

Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

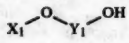
Division of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,915, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Aug. 24, 1984, Ser. No. 644,054
The portion of the term of this patent subsequent to Jun. 4, 2002, has been disclaimed.
Int. Cl.[4] C11B *9/00*
U.S. Cl. 252—522 R 9 Claims



GLC PROFILE FOR FRACTION 4 OF EXAMPLE I.

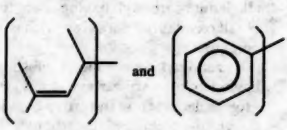
1. A process for augmenting or enhancing the aroma or taste

of a consumable material selected from the group consisting of perfume compositions, perfumed articles, colognes, foodstuffs, chewing gums, chewing tobaccos, medicinal products, toothpastes, smoking tobaccos and smoking tobacco articles comprising the step of adding to said consumable material an aroma or taste augmenting or enhancing quantity of at least one ether carbinol defined according to structure:



wherein X_1 is a moiety selected from the group consisting of:

and



and wherein Y_1 is a moiety selected from the group consisting of:

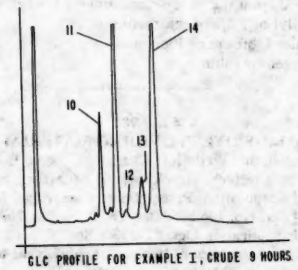
C_4–C_5 alkylene;
C_4–C_5 alkenylene; and
C_4–C_5 alkynylene.

4,619,781

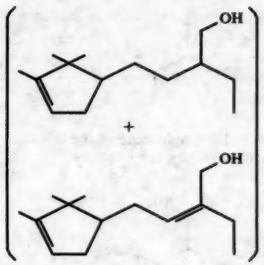
PROCESS FOR PREPARING MIXTURE CONTAINING 2-CAMPHOLENYLIDENBUTANOL, PRODUCT PRODUCED THEREBY AND PERFUMERY USES THEREOF

Wilhelmus J. Wiegers, Red Bank; Mark A. Sprecker, Sea Bright, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

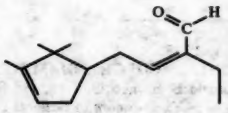
Filed Sep. 20, 1985, Ser. No. 778,442
Int. Cl.[4] C11B *9/00*; C07C *35/06*
U.S. Cl. 252—522 R **2 Claims**



1. A process for preparing a mixture of compounds comprising as a major quantity the compounds having the structures:



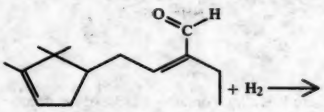
comprising the steps of (i) reacting the aldehyde having the structure:

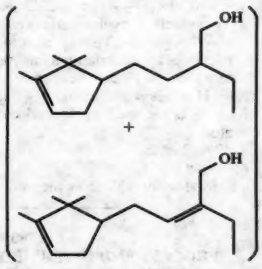


with hydrogen over a copper chromite catalyst having the formula:

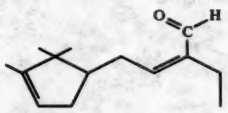
$CuO.CuCr_2O_4$

in the absence of additional reagents and in the absence of additional base, according to the reaction:

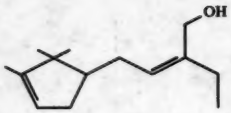




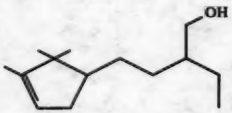
at a temperature in the range of from about 110° C. up to about 220° C.; at a pressure in the range of from about 100 up to about 1000 psig; the weight percent of catalyst based on reactant having the structure:



being from about 1 weight percent up to about 6 weight percent; the time of reaction being such that the reaction is terminated when 70–80% of the compound having the structure:



is in the reaction mass and the remainder of the reaction mass is primarily the compound having the structure:



and then (ii) recovering the resulting mixture by fractional distillation.

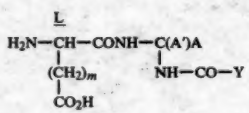
4,619,782

L-AMINODICARBOXYLIC ACID GEM-DIAMINES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,599
Int. Cl.[4] C07K 5/06
U.S. Cl. 560—122 **42 Claims**

1. A compound represented by the formula:



wherein

A is H, CO_2R where R is alkyl containing 1–3 carbon atoms;

A' is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is cycloalkyl, cycloakenyl, lower alkyl substituted cycloalkyl or cycloalkenyl, bicycloalkyl, bicycloalkenyl or tricycloalkyl containing up to 10 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0 or 1; and

m=0 or 1;

and food-acceptable salts thereof.

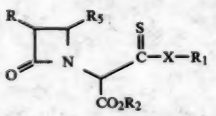
4,619,783

PROCESS AND INTERMEDIATES FOR THE PREPARATION OF PENEM DERIVATIVES

Ernest S. Hamanaka, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Jun. 10, 1983, Ser. No. 502,895
Int. Cl.[4] C07D 205/08, 403/12, 498/04, 401/12
U.S. Cl. 540—361 **8 Claims**

1. A compound of the formula



wherein

R is hydrogen, 1-hydroxyalkyl having 1 or 2 carbon atoms or wherein the 1-hydroxyalkyl is substituted with a hydroxyl-protecting group selected from the group consisting of benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl, 2,2,2-trichloroethoxycarbonyl or trialkylsilyl wherein each alkyl has from 1 to 6 carbon atoms;

R_1 is (alk)-G, (alk)-G_1,G_1 or $CH(G_2)_2$ wherein (alk) is an alkyl group having one to four carbon atoms;

G is hydrogen, alkoxy having one to five carbon atoms, 2-(alkoxy)ethoxy having three to seven carbon atoms, alkylthio having one to five carbon atoms, phenoxy, thiophenoxy, azido, amino, amino substituted with an amino-protecting group selected from the group consisting of benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl and 2,2,2-trichloroethoxycarbonyl; N-phenyl-N-alkylamino wherein the alkyl has one to four carbon atoms, N-alkanoylamino having two to six carbon atoms, N-alkoxyalkanoylamino having three to ten carbon atoms, 2-(N-alkanoylamino)ethoxy having four to eight carbon atoms, aminocarbonyl, aminocarbonyloxy, N-alkylaminocarbonylamino having two to five carbon atoms, alkanoylaminoacetylamino having four to seven carbon atoms, N-alkylaminocarbonyloxy, aminocarbonylalkoxy having two to five carbon atoms, N-alkylaminocarbonyl having two to five carbon atoms, N-(alkoxyalkyl)aminocarbonyl having three to nine carbon atoms;

G_1 is azetidinyl or azetidinyl substituted with N-alkanoyl having two to six carbon atoms or an amine-protecting group selected from the group consisting of benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl and 2,2,2-trichloroethoxycarbonyl; a five- or six-membered ring which is carbocyclic or heterocyclic having one or two oxygen atoms, one, two three or four nitrogen atoms, a sulfur atom, a nitrogen atom and an oxygen atom or a nitrogen atom and a sulfur atom, or said five- or six-membered ring substituted with alkyl having one to four carbon atoms, dialkyl each having one to four carbon atoms, oxo, amino, amino substituted with an amine-protecting group selected from the group consisting of benzyloxycarbonyl, p-nitrobenzyloxycarbonyl, allyloxycarbonyl and 2,2,2-trichloroethoxycarbonyl; alkoxycarbonyl having two to five carbon atoms, di(alkoxycarbonyl) each having two to five carbon atoms, aminocarbonyl, alkoxyalkyl having two to seven carbon atoms, phenyl, formyl, N-alkylaminocarbonyl having two to five carbon atoms, N-alkylaminocarbonylamino having two to five carbon atoms, alkanoylamino having two to five carbon atoms, alkoxy having one to four carbon atoms or phenoxyacetyl;

G_2 is alkanoylaminomethyl each having three to seven carbon atoms or alkoxy each having one to four carbon atoms;

R_2 is hydrogen, a group which forms an ester which is hydrolyzed in vivo or a carboxylic acid protecting group selected from the group consisting of benzyl, p-nitrobenzyl, allyl or 2,2,2-trichloroethoxy;

R_5 is chloro, bromo or iodo; and

X is oxygen or sulfur.

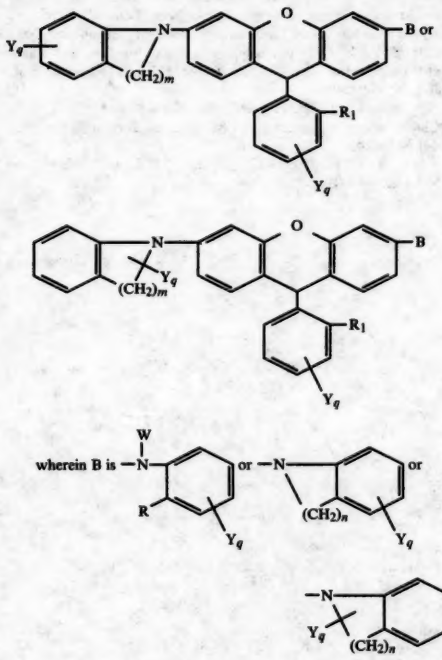
4,619,784

IMAGE DYE-PROVIDING MATERIALS

Louis Locatell, Jr., Wellesley; Charles M. Zepp, Boylston, and Ronald F. Cieciuch, Brookline, all of Mass., assignors to Polaroid Corporation, Patent Dept., Cambridge, Mass.

Division of Ser. No. 106,506, Dec. 26, 1979, Pat. No. 4,267,251.
This application Oct. 27, 1980, Ser. No. 200,953
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Int. Cl.[4] C07D 209/12, 215/14, 223/16
U.S. Cl. 540—593 **12 Claims**

1. A compound represented by the formula



each Y is a substituent having a diffusion control moiety; each q is 0 or 1 provided that at least one q is 1; W is H or alkyl having from 1 to 6 carbon atoms; R is H or alkyl having from 1 to 6 carbon atoms; R_1 is H, $—CO_2—$, $SO_3—$ or alkyl having from 1 to 6 carbon atoms; and m and n are each integers of from 2 to 6.

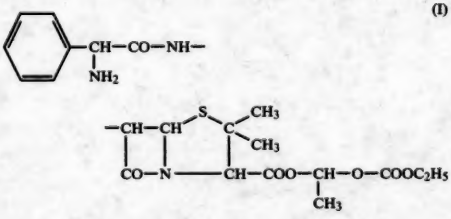
4,619,785

NOVEL SYNTHESIS ROUTE FOR BACAMPICILLIN

Luigi Ratti, Bergamo, Italy, assignor to Astra Lakemedel Aktiebolag, Sodertalje, Sweden

Filed Jun. 23, 1983, Ser. No. 507,717
Claims priority, application Italy, Jun. 29, 1982, 22141 A/82
Int. Cl.[4] C07D *499/08, 501/02*
U.S. Cl. 540—318 **10 Claims**

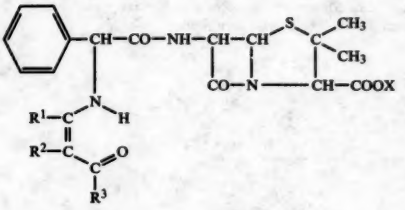
1. Process for the preparation of the 1-ethoxycarbonyloxyethyl ester of the 6-(D-(−)-α-amino-α-phenylacetamido)-penicillanic acid with the formula:



(I)

characterized by steps of:

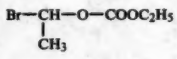
(a) in the presence of a material selected from the group consisting of an organic base and an alkaline carbonate in an aprotic solvent selected from the group consisting of N,N-dimethylacetamide, N,N-dimethylformamide, dimethoxyethane, dimethylsulphoxide, tetrahydrofuran and dioxane at a temperature between 0° C. and 60° C. for between 2 to 8 hours reacting ampicillin, or an alkaline salt, with a reactive derivative of acetoacetic acid to form the corresponding enamine with the formula:



(II)

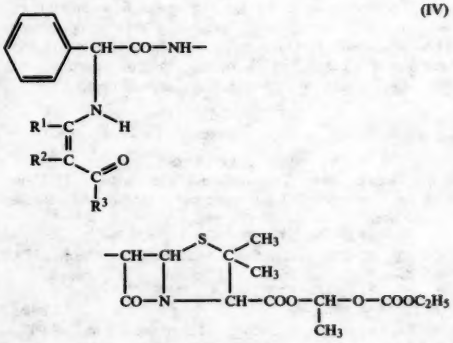
wherein R^1 represents an alkyl group containing 1–4 carbon atoms, a substituted or non-substituted aryl group or an aralkyl group; R^2 represents hydrogen, an alkyl group containing 1–4 carbon atoms, a substituted or non-substituted aryl group or an aralkyl group; R^3 represents an alkyl group containing 1–4 carbon atoms, a substituted or non-substituted aryl group, an aralkyl group, an alkoxy group containing 1–4 carbon atoms, an aryloxy group or an amine group, and X represents an alkali metal, an alkaline earth metal or an organic base;

(b) reacting the resulting intermediate with α-bromo-diethyl carbonate with the formula:



(III)

at a temperature of 15°–80° C. for 1–24 hours to form the corresponding ester with the formula:



(IV)

wherein R^1, R^2 and R^3 have the meanings specified above, and

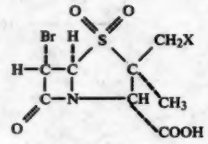
(c) mild hydrolysis in an acid medium to obtain the compound of formula (I).

4,619,786
PREPARATION OF 6-α-BROMO- AND/OR 6,6-DIBROMO-PENICILLANIC ACID-1,1-DIOXIDES

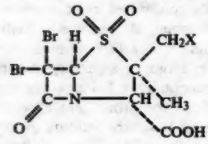
Peter W. Henniger, Leiden, and Johannes K. van der Drift, Delft, both of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

Filed Apr. 19, 1983, Ser. No. 486,981
Claims priority, application United Kingdom, Apr. 19, 1982, 8211301
Int. Cl.[4] C07D *499/00;* A61K *31/425*
U.S. Cl. 540—310 21 Claims

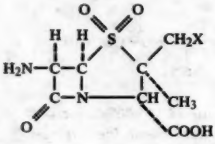
1. A process for the preparation of at lease one compound of a formula selected from the group consisting of



and



and their pharmaceutically acceptable salts and esters wherein X is selected from the group consisting of hydrogen and chlorine and acetoxy comprising diazotizing a compound of the formula



and pharmaceutically acceptable salts and esters thereof wherein X has the above definition with at least an equimolar amount of a nitrosating agent in the presence of 1 to 5 equivalents of a strong acid in solution or suspension in a mixture of water and an at least partially water-miscible organic solvent with the amount of water being 1 to 20% by volume and brominating the resulting diazotized compound with at least equimolar amounts of hydrogen bromide and bromine.

4,619,787
BETA LACTAMS

Erwin Götschi, Reinach, Switzerland, and Christian Hubschwerlen, Durmenach, France, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Nov. 13, 1984, Ser. No. 670,796
Claims priority, application Switzerland, Nov. 23, 1983, 6286/83
Int. Cl.[4] C07D *405/04;* C07F *7/10*
U.S. Cl. 540—200 2 Claims

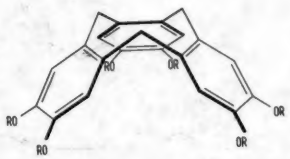
1. The compound, (3S,4S)-1-(2,4-dimethoxybenzyl)-4-[(R)-2,2-dimethyl-1,3-dioxolan-4-yl]-3-[(R)-1-hydroxyethyl]-2-azetidinone.

2. The compound, (3S,4S)-1-(t-butyldimethylsilyl)-4-[(R)-2,2-dimethyl-1,3-dioxolan-4-yl]-3-[(R)-1-hydroxyethyl]-2-azetidinone.

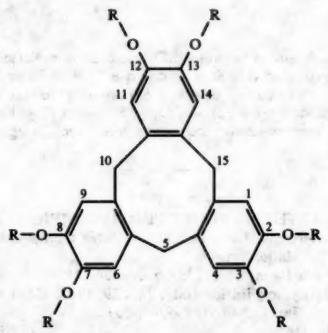
4,619,788
PYRAMIDAL LIQUID CRYSTALS

Herbert Zimmermann, Schriesheim, Fed. Rep. of Germany; Raphi Poupko; Zeev Luz, both of Rehovot, Israel, and Jean Billard, Paris, France, assignors to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V., Goettingen, Fed. Rep. of Germany

Filed Oct. 18, 1985, Ser. No. 788,813
Claims priority, application Fed. Rep. of Germany, Oct. 19, 1984, 3438424
Int. Cl.[4] C11C *3/00;* C07C *43/21, 69/773;* G02F *1/13*
U.S. Cl. 260—410.5 10 Claims

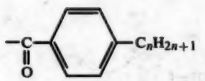


1. Hexasubstituted tribenzocyclononatriene derivatives of the general formula I

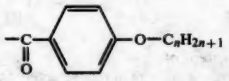


(I)

in which the residues R are the same or different and independently from each other represent alkly groups with at least 6 carbon atoms, alkanoyl groups with at least 10 carbon atoms or p-alkylbenzoyl or p-alkoxybenzoyl groups of the formula



or



in which n is an integer of at least 5.

4,619,789

PRETREATMENT PROCESS FOR RENDERING

Hans R. Strop, 12418 The Bluffs, and Richard R. Perry, 10815 Clearbrook Cir., both of Strongsville, Ohio 44136

Continuation of Ser. No. 556,007, Nov. 29, 1983, abandoned.
This application Dec. 27, 1985, Ser. No. 815,303
Int. Cl.[4] C11B *1/12*
U.S. Cl. 260—412.6 22 Claims

1. A rendering process comprising the steps of:
comminuting raw material to reduce and generally conform the raw material to a plurality of raw material particles having generally preselected particle sizes;
making a slurry comprising a mixture of the comminuted raw material and additional fat;
evaporating the slurry to form a generally demulsified slurry including a generally continuous phase fat and a generally continuous phase water; and
segregating said continuous phase fat from the demulsified slurry.

4,619,790

MANUFACTURE OF HIGHER ALKYLCARBOXYLIC ACIDS

Rudolf Kummer, Frankenthal, and Kurt Schwirten, Ludwigshafen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Feb. 1, 1978, Ser. No. 874,316
Claims priority, application Fed. Rep. of Germany, Mar. 4, 1977, 2709438
Int. Cl.[4] C07C *51/14, 53/126*
U.S. Cl. 260—413 3 Claims

1. A process for the manufacture of an alkylcarboxylic acid (where alkyl is of 6 to 20 carbon atoms) by hydrocarboxylating the corresponding olefin by means of a cobalt carbonyl compound in the presence of a solvent, wherein the solvent used is from 0.2 to 3 kg of N-methylpyrrolidone per kg of the olefin.

4,619,791

CARBONYLATION OF METHYL ACETATE TO ACETIC ANHYDRIDE

Jean Gauthier-Lafaye, Lyons, and Robert Perron, Charly, both of France, assignors to Rhone-Poulenc Chimie De Base, Courbevoie, France

Filed Oct. 21, 1982, Ser. No. 435,752
Claims priority, application France, Oct. 21, 1981, 81 20007
Int. Cl.[4] C07C *51/56*
U.S. Cl. 260—549 21 Claims

1. A process for the preparation of acetic anhydride, comprising carbonylating methyl acetate with carbon monoxide, in liquid phase, in an essentially anhydrous reaction medium, in the presence of a catalytically effective amount of (i) nickel, (ii) methyl iodide, (iii) an alkali metal iodide, and (iv) a crown ether.

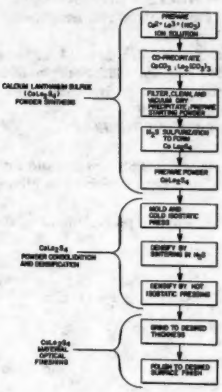
4,619,792

PROCESS FOR MAKING AN OPTICALLY TRANSMISSIVE BODY

Kenneth J. Saunders, Waltham, and Randal W. Tustison, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Filed Jun. 3, 1983, Ser. No. 500,702
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—1.2 8 Claims

1. A method for making a dense optically transmissive body comprising a ternary sulfide having a pair of cation types comprising the steps of:
coprecipitating a fine grained homogeneous powder including the pair of cation types of the ternary sulfide;
reacting the coprecipitated powder with a source of sulfide anions to convert said precipitate into the ternary sulfide; and



forming the ternary sulfide into the densified, optically transmissive body.

4,619,793

METHOD OF PRODUCING ANNEALED POLYVINYL ALCOHOL CONTACT LENS

Ping I. Lee, Valley Cottage, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 372,893, Apr. 29, 1982, abandoned.
This application Jul. 26, 1984, Ser. No. 633,687
Int. Cl.[4] B29D *11/00*
U.S. Cl. 264—2.6 32 Claims

19. A process for preparing an optically clear soft contact lens of swollen solid polyvinyl alcohol having a weight average molecular weight of at least about 6,000, which has been annealed, without prior crosslinking, under crystallinity promoting conditions, to substantially increase the crystallinity thereof, and swollen in a swelling solvent, the resultant annealed, swollen lens possessing an oxygen transmissibility capability in an aqueous environment in excess of that necessary to meet the needs of the human cornea comprising:
(a) forming a lens blank from a substantially non-crosslinked polyvinyl alcohol resin having a weight average molecular weight of at least 6,000;
(b) annealing said lens blank under crystallinity promoting conditions to effectively increase the elastic modulus of the subsequently swollen contact lens, such that the resulting annealed polyvinyl alcohol blank has a degree of crystallinity between about 0.195 and 0.70 based on the weight fraction of crystalline material present in the polyvinyl alcohol polymer;
(c) removing selected portions of said annealed blank until the remainder of the annealed blank constitutes a replica of said contact lens on a reduced scale; and
(d) swelling said annealed replica in an aqueous or nonaqueous swelling solvent, to obtain said substantially shape-retaining swollen contact lens, wherein said lens in its swollen equilibrium state with ocular tear fluid, possesses sufficient oxygen transmissibility to meet the needs of the human cornea.

4,619,794

SPONTANEOUS PREPARATION OF SMALL UNILAMELLAR LIPOSOMES

Helmut Hauser, Uerikon, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 466,235, Feb. 14, 1983, abandoned. This application Jan. 29, 1985, Ser. No. 696,228

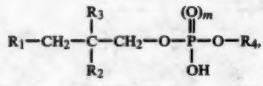
Claims priority, application Switzerland, Feb. 17, 1982, 981/82; Jan. 17, 1983, 237/83

Int. Cl.[4] B01J *13/02*

U.S. Cl. 264—4.1 **24 Claims**

1. A process for the spontaneous preparation of small unilamellar liposomes comprising, without additional energy input, dispersing

(a) a homogeneous layer of a phospholipid of the formula



(A)

wherein m is zero or one, one of R_1 and R_2 is hydrogen, hydroxy or C_1–C_4-alkyl and the other is alkyl, alkenyl, alkoxy or alkenyloxy, each of 10–20 carbon atoms, or is acyloxy of 10–50 carbon atoms, R_3 is hydrogen or C_1–C_4-alkyl, and R_4 is hydrogen, C_1–C_7-alkyl, carboxy-lower alkyl, 2-aminoethyl, 3- amino-n-propyl, 2-methylaminoethyl, 3-methylamino-n-propyl, 2-dimethylaminoethyl, 3-dimethylamino-n-propyl, 2-amino-2-carboxyethyl, 3-amino-3-carboxy-n-propyl, 2-trimethylammonioethyl, 2-triethylammonioethyl, 3-tri-methylammonio-n-propyl, 3-triethylammonio-n-propyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, 2-methoxyethyl, 3-methoxy-n-propyl, 2,3-ethylenedioxypropyl, 2,3-(2,2-propylene)dioxypropyl, 2-chloro- or 2-bromoethyl, 2- or 3-chloro-n-propyl or 2- or 3-bromo-n-propyl, or a carbohydrate radical of 5 to 12 carbon atoms, or, if R_1 and R_2 are hydrogen or hydroxy and R_3 is hydrogen, is a steroid radical, and an additional phospholipid of the formula A, wherein each of R_1 and R_2 independently of the other are alkyl, alkenyl, alkoxy or alkenyloxy, each of 10–20 carbon atoms, or is acyloxy of 10–50 carbon atoms, R_3 is hydrogen or C_1–C_4-alkyl and R_4 is C_1–C_7-alkyl, carboxy-lower alkyl, 2-aminoethyl, 3-amino-n-propyl, 2-methylaminoethyl, 3-methylamino-n-propyl, 2-dimethylaminoethyl, 3-dimethylamino-n-propyl, 2-amino-2-carboxyethyl, 3-amino-3-carboxy-n-propyl, 2-trimethylammonioethyl, 2-triethylammonioethyl, 3-trimethylammonio-n-propyl, 3-triethylammonio-n-propyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, 2-methoxyethyl, 3-methoxy-n-propyl, 2,3-ethylenedioxypropyl, 2,3-(2,2-propylene)dioxypropyl, 2-chloro- or 2-bromoethyl, 2- or 3-chloro-n-propyl or 2- or 3-bromo-n-propyl, or a carbohydrate radical of 5 to 12 carbon atoms; or of a phospholipid of the formula A, wherein m is zero or one, each of R_1 and R_2 independently of the other is alkyl, alkenyl, alkoxy, or alkenyloxy, each of 10–20 carbon atoms, or is acyloxy of 10 to 50 carbon atoms, and R_3 and R_4 are hydrogen and optionally an additional phospholipid of the formula A wherein m is zero or one, each of R_1 and R_2 independently of the other is alkyl, alkenyl, alkoxy, or alkenyloxy, each of 10–20 carbon atoms, or is acyloxy of 10 to 50 carbon atoms, and R_3 is hydrogen or C_1–C_4-alkyl, and R_4 is C_1–C_7-alkyl, carboxy-lower alkyl, 2-aminoethyl, 3-amino-n-propyl, 2-methylaminoethyl, 3-methylamino-n-propyl, 2-dimethylaminoethyl, 3-dimethylamino-n-propyl, 2-amino-2-carboxyethyl, 3-amino-3-carboxy-n-propyl, 2-trimethylammonioethyl, 2-triethylammonioethyl, 3-trimethylammonio-n-propyl, 3-triethylammonio-n-propyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, 2-methoxyethyl, 3-methoxy-n-propyl, 2,3-ethylenedioxypropyl, 2,3-(2,2-propylene)dioxypropyl, 2-chloro- or 2-bromoethyl, 2- or 3-chloro-n-propyl or 2- or 3-bromo-n-propyl, or a carbohydrate radical of 5 to 12 carbon atoms in an aqueous phase which is raised to a pH-value at least 11 or

(b) a homogeneous layer of a phospholipid of the formula A wherein m is 0 or 1, one of R_1 and R_2 is hydrogen, hydroxy or C_1–C_4-alkyl, and the other is alkyl, alkenyl, alkoxy or alkenyloxy, each of 10 to 20 carbon atoms, or is acyloxy of 10 to 50 carbon atoms, R_3 is hydrogen, and R_4 is lower alkyl which is substituted by an ammonio group and an additional phospholipid of the formula A wherein each of R_1 and R_2 independently of the other are alkyl, alkenyl, alkoxy or alkenyloxy, each of 10–20 carbon atoms, or is acyloxy of 10–50 carbon atoms, R_3 is hydrogen or C_1–C_4-alkyl and R_4 is C_1–C_7-alkyl, carboxy-lower alkyl, 2-aminoethyl, 3- amino-n-propyl, 2-methylaminoethyl, 3-methylamino-n-propyl 2-dimethylaminoethyl, 3-dimethylamino-n-propyl, 2-amino-2- carboxyethyl, 3-amino-3-carboxy-n-propyl, 2-trimethylammonioethyl, 2-triethylammonioethyl, 3-trimethylammonio-n-propyl, 3-triethylammonio-n-propyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, 2methoxyethyl, 3-methoxy-n-propyl, 2,3-ethylene- dioxypropyl, 2,3-(2,2-propylene) dioxypropyl, 2-chloro- or 2-bromoethyl, 2- or 3-chloro-n-propyl or 2- or 3-bromo-n-propyl, or a carbohydrate radical of 5 to 12 carbon atoms; or of a phospholipid of the formula A, wherein m is 0 or 1, each of R_1 and R_2 independently of the other is alkyl, alkenyl or alkenyloxy, each of 10 to 20 carbon atoms, or is acyloxy of 10 to 50 carbon atoms, R_3 is hydrogen, and R_4 is lower alkyl which is substituted by an ammonio-lower alkylammonio group and an additional phospholipid of the formula A wherein each of R_1 and R_2 independently of the other are alkyl, alkenyl, alkoxy or alkenoxy, each of 10–20 carbon atoms, or is acyloxy of 10–50 carbon atoms, R_3 is hydrogen or C_1–C_4-alkyl and R_4 is C_1–C_7-alkyl, carboxy-lower alkyl, 2-aminoethyl, 3-amino-n-propyl, 2-methylaminoethyl, 3-methylamino-n-propyl, 2-dimethylaminoethyl, 3-dimethylamino-n-propyl, 2-amino-2-carboxyethyl, 3-amino-3-carboxy-n-propyl, 2-trimethylammonioethyl, 2-triethylammonioethyl, 3-trimethylammonio-n-propyl, 3-triethylammonio-n-propyl, 2-hydroxyethyl, 2,3-dihydroxypropyl, 2-methoxyethyl, 3-methoxy-n-propyl, 2,3-ethylenedioxypropyl, 2,3-(2,2-propylene)dioxypropyl, 2-chloro- or 2-bromoethyl, 2- or 3-chloro-n-propyl or 2- or 3-bromo-n-propyhl, or a carbohydrate radical of 5 to 12 carbon atoms, in an aqueous phase which is lowered to a pH-value of about or less than about 1 and the aqueous phase is neutralized with a physiologically acceptable acid or base and the unilamellar liposomes obtained are separated from multilamellar liposomes.

4,619,795

METHOD FOR PREPARING LIPID VESICLES

Beri Cohen, White Plains, N.Y., assignor to Technicon Instruments Corp., Tarrytown, N.Y.

Filed Dec. 24, 1984, Ser. No. 685,360

Int. Cl.[4] B01J *13/02*; A61K *9/50*

U.S. Cl. 264—4.6 **15 Claims**

1. A method of preparing vesicles, which method comprises:

a. depositing a coating of lipid onto the surface of one or more particles, said particles being deformable in a hydrating aqueous phase, to form a coated particle; and

b. deforming said coated particle by contacting it with a hydrating aqueous phase in order to fragment said lipid coating so as to disperse fragments of said lipid into said aqueous phase and subject said fragments to multidirectional hydration, whereby lipid vesicles are formed in said aqueous phase.

2. The method of claim 1, wherein said depositing step comprises forming an organic phase comprising lipid and an organic solvent, contacting said deformable particle with said organic phase, and evaporating said organic solvent, said deformable particle being formed of a material which is suffi-

ciently hydrophobic when exposed to said organic phase to permit deposition of said lipid coating.

4,619,796

PROCESS FOR PREPARATION OF POROUS CARBON PLATES

Yasuhira Awata, Tokyo, and Osamu Iwaki, Ichikawa, both of Japan, assignors to Oji Paper Company, Ltd., Tokyo, Japan

Filed Jun. 21, 1984, Ser. No. 623,260
Int. Cl.[4] D01F *9/14*
U.S. Cl. 264—29.4 12 Claims

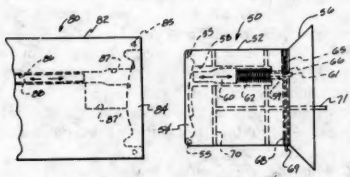
1. A process for the preparation of porous carbon plates, which comprises impregnating a sheet formed from a mixture consisting essentially of 65to 90% by weight of a carbon fiber-forming unoxidized organic fiber and 10 to 35% by weight of a pulp according to a paper-making method with a solution of an organic polymeric substance to prepare an impregnated sheet, subjecting the impregnated sheet to an oxidizing treatment, and carbonizing the resulting infusibilized sheet at a temperature of at least 800° C. in an inert gas atmosphere.

4,619,797

METHOD FOR PRODUCING A DISPENSING CONTAINER FOR PRESSURIZED FLUIDS

Walter K. Chlystun, 327 St. James Dr., Spartanburg, S.C. 29301

Division of Ser. No. 131,248, Mar. 17, 1980, Pat. No. 4,529,108. This application Nov. 19, 1984, Ser. No. 673,111
Int. Cl.[4] B29C *49/80, 49/00, 51/00*
U.S. Cl. 264—40.1 10 Claims



1. A method of reforming a portion of a container having a molded thermoplastic synthetic polymeric top wall with a pressure dome section and a nestable collapsible spout therein comprising the steps of:

(a) providing a molded container top of thermoplastic synthetic polymeric material and having a nestable collapsible spout;

(b) locating said molded container top between a pair of male and female forming mandrels, said mandrels having complementary die sections at facing ends of same, said die sections cooperatively defining at least an arcuate dome, said male die section defining a receiving recess for receiving said spout when said spout is extended, and said female die section defining a passageway for receiving said spout when said spout is everted;

(c) heating at least the area of said molded top that is to be reformed adequate to convert said polymeric material thereat to an amorphous state;

(d) bringing said male and female mandrels into registry at opposite sides of said top while receiving said spout in said receiving recess in said male die section and entrapping at least the portion of the top to be reformed between said male and female mandrels and causing said entrapped portion of said top to reform to the arcuate dome shape defined by said complementary die sections while said polymeric material is in the amorphous state;

(e) cooling said reformed top section adequate to return the polymeric material to a crystalline state; and

(f) withdrawing said mandrels from registry.

4,619,798

METHOD OF MANUFACTURING PARTS FOR USE TO THE HEAT PROCESSING FURNACE

Takashi Tanaka, Yamagata, and Kenro Hayashi, Hadano, both of Japan, assignors to Toshiba Ceramics Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1984, Ser. No. 685,800
Claims priority, application Japan, Dec. 26, 1983, 58-251854
Int. Cl.[4] C04B *41/53*
U.S. Cl. 264—62 14 Claims

1. A method of manufacturing parts for a heating furnace comprising:

(a) adding a sintering assistant of 0.5–2.0 wt. % and a binder, to SiC powder which has an average particle diameter of 2 μm or less, and molding it to a predetermined form:

(b) purifying the molded body by placing it in an atmosphere consisting essentially of of halogen gas or hydrogen halide gas at a temperature in the range of 800°–1300° C.;

(c) degassing the purified molded body in a vacuum under a temperature higher than that employed during said purification;

(d) sintering the degassed molded body; and

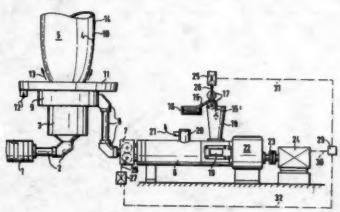
(e) coating a SiC film on at least part of the sintered body by chemical vapor deposition.

4,619,799

PROCESS OF MAKING SHEET MATERIAL COMPRISING A SUBSTRATE WEB OF SYNTHETIC THERMOPLASTIC MATERIAL AND AN ADHESIVE LAYER CONSISTING OF A NON-CROSSLINKABLE ELASTOMER

Wolfgang Teerling, Tecklenburg, Fed. Rep. of Germany, assignor to Windmoller & Holscher, Lengerich, Fed. Rep. of Germany

Filed Jul. 19, 1985, Ser. No. 756,721
Claims priority, application Fed. Rep. of Germany, Jul. 20, 1984, 3426865; Feb. 14, 1985, 3505128
Int. Cl.[4] B29C *33/10, 33/18*
U.S. Cl. 264—101 3 Claims



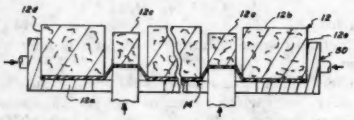
1. A process of making sheet material comprising a substrate web of synthetic thermoplastic material and an adhesive layer of a non-crosslinkable elastomer, comprising the steps of co-extruding thermoplastic material and non-crosslinkable elastomeric material through an extrusion die to produce the sheet material, heating the elastomeric material, prior to extrusion through the extrusion die, above its devolatilization temperature by a feed screw of a screw extruder, devolatilizing the heated elastomeric material through venting means in the screw extruder, and subsequently pressurizing the devolatilized elastomeric material by a booster to a pressure which is sufficient to overcome back pressure applied by the extrusion die.

4,619,800

METHOD OF MAKING A DECORATIVE COMPOSITE PANEL

Phillip J. Santo, 12 Mountain Rd., Rochester, N.Y. 14625

Filed Apr. 15, 1985, Ser. No. 723,145
Int. Cl.[4] B32B *31/04*
U.S. Cl. 264—139 **6 Claims**



1. A method for making a decorative panel having the appearance of tongue-in-groove construction, from a composite structure including a bass member and a decorative surface veneer on such member, said method comprising the steps of:

removing a portion of said base member, such portion including a segment of said base member to a first depth less than the total depth of said base member measured from the surface of said base member opposite to said veneer, and spaced segments of said base member to a total depth of said base member, leaving an intermediate part of said base member connected to said veneer between such spaced segments;

substantially simultaniously urging the sides of such base member opposite the removed portion toward one another and said intermediates part toward the surface of said base member opposite the veneer until the remaining portions of said base member and said intermediate part are in mutual contact and lie in a plane; and

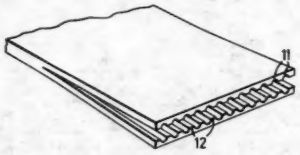
permanently securing the intermediate part to such sides of said base member.

4,619,801

METHOD FOR PRODUCING AN IMPROVED POLYMERIC HEAT EXCHANGE PANEL

Thomas P. Engel, Verfahrenstechnik, Haldenhof, 6287 Aesch-/Lu, Switzerland

Continuation-in-part of Ser. No. 286,965, Jul. 27, 1981, abandoned. This application May 29, 1984, Ser. No. 614,773
Claims priority, application United Kingdom, Jul. 29, 1980, 8024821; Sep. 25, 1980, 8030965; Oct. 23, 1980, 8034194
Int. Cl.[4] B28B *11/06*
U.S. Cl. 264—146 **16 Claims**



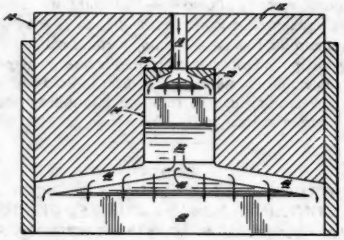
1. A method for the production of a polymeric heat exchange panel comprising a sheet having a multiplicity of longitudinally extruding passages and a plurality of juxtaposed dividing walls respectively disposed between adjacent said passages, wherein each end of said passages is closed to define a manifold space, and at least one of an inlet and an outlet communicating with at least one of said manifold spaces, said method comprising forming at least one of said manifold spaces by severing longitudinally without substantial removal of dividing wall material said plurality of juxtaposed dividing walls towards an end of the sheet to form severed opposed sides thereof, plasticizing said severed opposed sides of said sheet at an elevated temperature and molding said opposed sides together at end edges thereof to form a molded end wall having a longitudinal dimension substantially greater than a thickness of a wall of said sheet, wherein the severed opposed sides are separated during molding by means selected from the group consisting of a spider and compressed air.

4,619,802

DIE WITH COMBINING ADAPTOR INSERT AND MELT-LAMINATION PROCESS

Peter Cloeren, 2206 N. 16th St., Orange, Tex. 77630

Filed May 21, 1984, Ser. No. 612,307
Int. Cl.[4] B28B *3/20*; B29C *47/00*
U.S. Cl. 264—171 **5 Claims**



1. A process for making a laminated sheet having layers each of substantially uniform thickness and each with a lessened curtaining effect, said process comprising forming a layered melt stream in the proximity of a locus at which said layered melt stream is caused to diverge and thereby undergoes tranverse flow, such that profiling of said layered melt stream is not essential to produce said laminated sheet from molten thermoplastic streams of dissimilar flow properties, and such that the curtaining effect is lessened.

3. An extrusion apparatus for making a laminated sheet each layer of which is of substantially uniform thickness, said extrusion apparatus comprising

(a) a die comprising a manifold chamber, and

(b) a removable, combining adaptor inserted in a cavity of said die for receiving said combining adaptor,

wherein said combining adaptor comprises a first flow channel, and said extrusion apparatus comprises a second flow channel; and wherein an adjustable flow divider is disposed between said first flow channel and second flow channel, said first flow channel and said second flow channel converging at a point of confluence to form an exit flow passage; said exit flow passage connecting to said die manifold chamber within which is a locus of divergence; and said locus of divergence being in the proximity of said point of confluence such that profiling of a layered melt stream formed at said point of confluence is not essential to produce said laminated sheet from thermoplastic streams of dissimilar flow properties.

4,619,803

SELF-TEXTURING NYLON YARN SPINNING PROCESS

Jing-peir Yu, Pensacola, Fla., assignor to Monsanto Company, St. Louis, Mo.

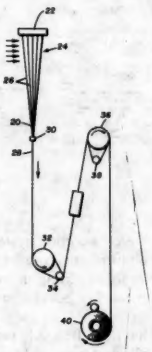
Filed Jul. 23, 1984, Ser. No. 633,313
Int. Cl.[4] B29C *47/88*
U.S. Cl. 264—176.2 **10 Claims**

1. A process for spinning a yarn having latent crimp, comprising:

(a) spinning a plurality of filaments, each of said filaments being formed by:

(1) generating first and second sub-streams of a molten polymer, and first sub-stream having a higher temperature than said second sub-stream;

(2) metering said sub-streams at given rates through separate passageways in a spinneret;
(3) said passageways being selected and arranged such that said sub-streams unite and merge side-by-side at a point below a plane 0.15 mm above the face of said spinneret to form a combined stream having a relatively cool side comprising said second sub-stream and a relatively hot side comprising said first sub-stream;
(4) directing quenching air against said combined stream below said spinneret from a given direction to thereby quench said combined stream into a filament, said given



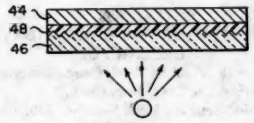
direction is selected so that said quench air preferentially impinges on said relatively cool side; and
(5) withdrawing said filament from said combined stream at a spinning speed above 2500 MPM; and
(b) converging from filaments at a given distance from said spinneret to form said yarn;
(c) said polymer, the temperature of said sub-streams, said metering rates, said given direction, and given distance, and said spinning speed being selected such that said filament has an elongation below 100% and a bulk of at least 10%.

4,619,804

FABRICATING OPTICAL RECORD MEDIA

Eric M. Leonard, Rochester; Robert V. Fister, Hilton, and James R. Pledger, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 15, 1985, Ser. No. 723,410
Int. Cl.[4] B29C *33/42*
U.S. Cl. 264—220 **15 Claims**



1. A process for making at least a single-faced, optical wire and/or read recording disk having a sub-layer with a desired high-resolution featured surface, comprising the steps of:
coating a polished surface of a glass blank with a continuous metal coating;
applying a layer of photoresist material to said metal coating;
exposing said photoresist layer so as to create therein a latent image of a desired pattern;
developing said latent image, leaving some portions of said metal coating uncovered and other portions thereof covered by remaining portions of said photoresist layer;
etching away said uncovered portions of said metal coating, leaving corresponding portions of said glass blank uncovered and other portions thereof still covered by said other portions of said metal coating covered by remaining portions of said photoresist layer;
removing said remaining portions of said photoresist layer from said other portions of said metal coating;
plasma etching into said uncovered portions of said glass blank while said other portions thereof remain covered by said other portions of said metal coating;
removing said other portions of said metal coating from said other portions of said glass blank, thereby leaving a transparent glass master mold that is featured in relation to said desired pattern;
positioning an opaque substantially flat metal substrate in spaced alignment with said transparent featured glass master mold so as to define a thin gap therebetween;
filling said gap with a viscous composition that is radiation-curable to a solid plastic without undergoing significant shrinkage;
irradiating said composition through said glass master mold so as to cure said composition to a solid plastic sub-layer having said desired high-resolution featured surface; and
removing said glass master mold, leaving said plastic sub-layer adhered to said metal substrate.

4,619,805

METHOD OF PRODUCING POROUS CARBON BODIES OF HIGH PERMEABILITY

Francisco J. Dias, Jülich; Marian Kampel, Heinsberg-Oberbruch, and Hartmut Luhleich, Düren, all of Fed. Rep. of Germany, assignors to Kernforschungsanlage Jülich Gesellschaft mit beschränkter Haftung, Jülich, Fed. Rep. of Germany

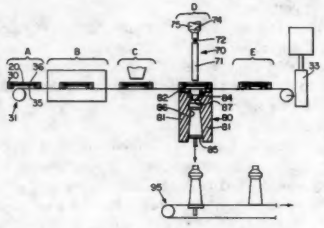
Continuation of Ser. No. 579,656, Feb. 13, 1984, abandoned.
This application Jun. 3, 1985, Ser. No. 741,016
Claims priority, application Fed. Rep. of Germany, Feb. 18, 1983, 3305530
The portion of the term of this patent subsequent to Jul. 30, 2002, has been disclaimed.
Int. Cl.[4] C01B *31/36*
U.S. Cl. 264—29.5 **11 Claims**

1. Method of producing permeable porous molded bodies of carbon which are capable of high fluid throughput, comprising the steps of:
preparing a composite molding powder from carbon powder and a cokable organic binder;
molding a cohesive precursor body in the green state from said molding powder;
crushing said precursor body in the green state in a manner selected for obtaining a granulate predominantly of a desired size within the range of particle size from 0.2 to 10 mm;
selecting from said granulate a fraction having a maximum particle size not exceeding twice the minimum particle size, said fraction having particle sizes within the range from 0.2 to 10 mm and being selected as to average particle size by reference to the permeability desired for the end product;
molding a second body in the green state from said selected granulate fraction with pressing at a pressure that is lighter, the greater is said permeability desired for said end product, and
coking said second green-state body by heating in vacuum or in an inert atmosphere up to a temperature in the range between 600° and 1000° C., thereby producing said end product having high-throughput permeability.

4,619,806
METHOD OF FORMING HIGHLY ORIENTED THERMOPLASTIC ARTICLES

Charles L. Gunn, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Mar. 15, 1985, Ser. No. 712,042
Int. Cl.[4] B29C 51/06
U.S. Cl. 264—522 13 Claims



1. A method of forming deep drawn oriented thermoplastic articles comprising the steps:

(a) planarly supporting a sheet of at least partially crystalline thermoplastic polymeric material;

(b) establishing at least one differentially heated area within said sheet; said area comprising an outer cool zone having a temperature range generally below the crystalline melt point of the thermoplastic material, a hot zone disposed within said outer cool zone having a temperature range generally above the crystalline melt point but below the complete melt point of the thermoplastic material, and an inner cool zone located centrally of said hot zone and having a temperature range generally below the crystalline melt point of the thermoplastic material;

(c) placing said heated sheet between a female mold unit and a forming mandrel, said inner cool zone generally axially aligned therewith;

(d) driving said forming mandrel against the inner cool zone of the heated area of said sheet and into said female mold unit so that said mandrel is first drawn radially inwardly from portions of said hot zone located radially outside of the orifice of said female mold and around said mandrel as it is stretched into said female mold thereby forming an elongated generally cylindrically shaped preform having a central cavity, said forming mandrel longitudinally stretching said material a distance sufficient to cause at least a portion of the walls of said preform to undergo strain hardening, and said outer cool zone maintaining tension control of said sheet material throughout the forming process and permitting the planar support of said sheet material about the periphery of said differentially heated area without clamping the same;

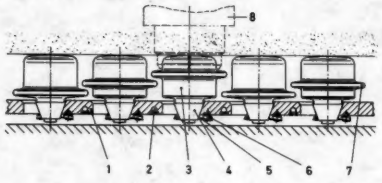
(e) subjecting said central cavity of said elongated preform to increased internal fluid pressure to radially expand the walls of said preform and force the same against the interior surface of said female mold; and

(f) maintaining said internal fluid pressure for a time sufficient to allow the expanded material to cool and set.

4,619,807
HEAT SHIELD

Heinz E. Kotzlowski, Ismaning, Fed. Rep. of Germany, assignor to Max-Planck-Gesellschaft Zur Foerderung der Wissenschaften E.V., Fed. Rep. of Germany

Continuation of Ser. No. 387,946, Jun. 14, 1982, abandoned.
This application Dec. 27, 1984, Ser. No. 685,603
Claims priority, application Fed. Rep. of Germany, Jul. 1, 1981, 3125970
Int. Cl.[4] G21B 1/00
U.S. Cl. 376—136 7 Claims



1. In a nuclear fusion reaction system having a vessel, said vessel containing a hot plasma, the improvement comprising a heat shield structure for shielding the inner surface of the walls of said vessel from the hot plasma, said heat shield structure comprising:

a support plate having a first side facing the inner surface of said vessel walls and a second side facing away from the inner surface of said vessel walls, said support plate having a plurality of holes extending from said first to said second side, each of said holes being provided with a substantially annular seat facing said first side, said support plate provided with conduit means for conducting a coolant for removing heat from said support plate;

and a plurality of heat shield members, each made of thermally conductive material, said members being arranged to detachably mount to said holes in said support plate, each of said members having a body portion arranged when mounted to project from said first side of said support plate and to shield said vessel from the hot plasma, and each of said members having a support portion for thermally conductively engaging said seat on said support plate, said support portion including a substantially annular surface arranged to mate with said seat and including spring means interconnecting said support portion with said second side of said support plate and applying force on said member to pull said support portion of said member into said hole and press said annular surface against said seat.

4,619,808
SYSTEM AND METHOD FOR CONSOLIDATING SPENT NUCLEAR FUEL

Frank J. Formanek, West Suffield, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed Sep. 23, 1983, Ser. No. 535,105
Int. Cl.[4] G21C 19/00
U.S. Cl. 376—272 11 Claims

1. A system for consolidating spent fuel rods from a nuclear fuel assembly into a box for placement in a fuel storage area, comprising:

a. a fuel assembly disassembly station including a vertically oriented disassembly enclosure having an open upper end;

b. a fuel transfer station including a vertically oriented transfer enclosure having an open upper end;

c. a fuel consolidation station including a vertically oriented consolidation enclosure having an open upper end;

d. a generally tapered fuel transfer canister fully and removably insertable within the transfer enclosure, having an open upper end and a smaller lower end removably insert-

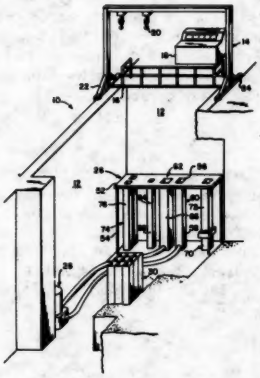
able within the open upper end of the consolidation enclosure, said canister including means therewithin for guiding fuel rods inserted at the upper end into more closely packed array at the lower end;

e. a fuel consolidation box open at least at the upper end and removably located within the consolidation enclosure, having a uniform cross sectional area substantially the same as the cross sectional area of the lower end of the transfer canister;

f. base means detachably secured to the lower end of the transfer canister;

g. means for exposing the fuel rods of the fuel assembly to direct access from above when the assembly is located within the disassembly enclosure;

h. a fuel rod pulling tool selectively locatable over the disassembly station and the fuel transfer station, for repeatedly removing a preselected group of fuel rods from a fuel



assembly in the disassembly enclosure and inserting the group of rods fully into a transfer canister in the transfer enclosure, until the canister is fully loaded and the rods are supported by the base;

i. means for removing the fully loaded transfer canister from the transfer enclosure and aligning the lower end of the transfer canister with the upper end of the consolidation box;

j. means associated with the consolidation station for lowering the base and fuel rods supported thereon, from the transfer canister downward to the lower end of the consolidation box;

k. means for supporting the base in the lower end of the consolidation box;

l. means for removing the consolidation box with fuel rods consolidated therein, from the consolidation enclosure to a fuel storage area.

4,619,809

STEAM GENERATION AND REHEAT APPARATUS

Donald C. Schluderberg, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 30, 1983, Ser. No. 480,450
Int. Cl.[4] G21D *1/00*
U.S. Cl. 376—402 **17 Claims**

1. Steam generation and reheat apparatus comprising:

a. means for evaporating water to form saturated steam;

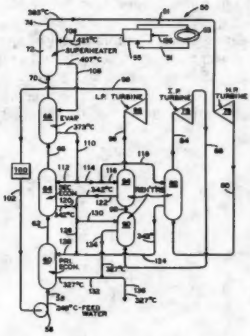
b. means for superheating the saturated steam for delivery to a heat engine;

c. at least one means for reheating exhaust steam from a heat engine for delivery to a lower pressure heat engine;

d. economizer means for pre-heating water before delivery of the water to said evaporator means;

e. means for flowing an heat supply fluid in heat exchange relation with the water an steam in series flow through said superheated means and said evaporator means; and

f. means for flowing the heat supply fluid, after its exit from said evaporator means, in heat exchange relation with the



water and exhaust steam in parallel flow through said reheat means and said economizer means; and

g. means for imparting thermal energy to the heat supply fluid.

4,619,810

DENTAL ALLOYS FOR PORCELAIN-FUSED-TO-METAL RESTORATIONS

Arun Prasad, Cheshire, Conn., assignor to Jeneric Industries, Inc., Wallingford, Conn.

Continuation of Ser. No. 570,627, Jan. 13, 1984, abandoned. This application Oct. 3, 1985, Ser. No. 783,327
Int. Cl.[4] C22C *5/04*
U.S. Cl. 420—463 **9 Claims**

1. A palladium based dental alloy, free of silver, nickel, copper and cobalt, consisting essentially of, on a weight percent basis:

gold, 8–25
gallium, 4–10
boron, 0.05–0.25
rhenium, 0.1–0.5
indium and/or tin, 0–20

and the balance, palladium—with the proviso that when a mixture of gallium, indium and/or tin is incorporated in the alloy, the total weight percent of gallium, indium and/or tin ranges from about 8 to 20, said alloy exhibiting a yield strength greater than 50,000 psi, an ultimate tensile strength of greater than 60,000 psi, an elongation greater than 10%, and a melting point ranging from 2200° to 2400° F.

4,619,811

APPARATUS FOR GROWING GAAS SINGLE CRYSTAL BY USING FLOATING ZONE

Jun-ichi Nishizawa, Sendai, Japan, assignor to Zaidan Hojin Handotai Kenkyu Shinkokai, Sendai, Japan

Continuation of Ser. No. 525,541, Aug. 22, 1983, abandoned. This application Sep. 17, 1985, Ser. No. 777,004
Claims priority, application Japan, Aug. 27, 1982, 57-149747
Int. Cl.[4] C30B *13/20, 13/28, 35/00*
U.S. Cl. 422—109 **4 Claims**

1. An apparatus for growing GaAs single crystals using a floating zone method, said apparatus comprising:

a closed cylinder charged with a GaAs polycrystal and an adjacently located GaAs single seed crystal,

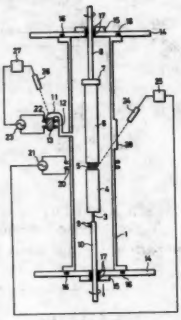
an As vessel charged with As and communicating, via a narrow passage, with said closed cylinder for supplying As vapor into said closed cylinder,

first heating means for heating said GaAs polycrystal and establishing a GaAs melted portion,

first means for measuring the temperature of the GaAs melted portion,

first temperature controller connected to said first temperature measuring means and said first heating means for having said GaAs melted portion at a temperature set at or just above the melting point of GaAs,

second heating means for holding said As vessel at a substantially constant temperature sufficient to impart to a GaAs single crystal being grown an optimum As vapor pressure to cause said GaAs single crystal being grown to be at least substantially devoid of deviation from the stoichiometric composition, said second heating means providing sufficient heat to said As vessel and said narrow passage to prvent said As vapor from depositing on the inside of said closed cylinder,



second means for measuring the temperature in said As vessel,

second temperature controller connected to said second temperature measuring means and said second heating means for keeping said As vessel at a constant temperature,

first rotating and vertically moving means for said GaAs polycrystal connected to a rod rotated by a chuck,

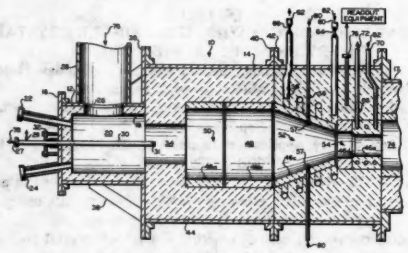
second rotating and vertically moving means for said GaAs single seed crystal connected to a rod rotated by a chuck.

4,619,812

CARBON BLACK PRODUCTION APPARATUS

Lawrence K. Murray, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 4, 1985, Ser. No. 688,678
Int. Cl.[4] C09C *1/48*
U.S. Cl. 422—156 **1 Claim**



1. A carbon black producing apparatus comprising:

a hollow refractory section having an interior surface which defines a chamber, said chamber having an upstream end and a downstream end, and also having a converging zone generally frustoconical in shape, wherein said converging zone has a first end and also a second end which faces the upstream end of said chamber and which is of a larger diameter than said first end, said chamber also having a throat zone, adjacent to the downstream end of said chamber, in direct fluid communication with said converging zone first end, said chamber additionally having a combustion zone adjacent said upstream end and in direct fluid communication with said converging zone second end;

means for introducing a combustible mixture into said combustion zone at said upstream end;

means for introducing a carbonaceous feedstock directly into said converging zone so that the feedstock mixes with the combustible mixture; and

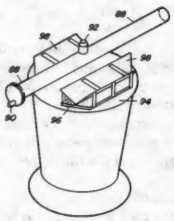
a cooling means for passing coolant fluid through a passageway defined by at least one spirally shaped tubular member embedded in said refractory section so as to be coaxially positioned with respect to said chamber and so as to extend axially along substantially the entire length of said converging zone, the passageway surround only said converging and throat zones.

4,619,813

GAS ABSORPTION SYSTEM

James A. Healey; Robert C. Duncan, both of Edmundston, and Charles F. Roussel, St-Jacques, all of Canada, assignors to Fraser Inc., Edmundston, Canada

Filed Feb. 14, 1985, Ser. No. 701,675
Claims priority, application Canada, Apr. 17, 1984, 452239
Int. Cl.[4] B01D *50/00, 47/14*
U.S. Cl. 422—171 **4 Claims**



1. A gas absorption system comprising a vertical housing having a gas inlet at its lower end and a gas outlet at its upper end and a plurality of superposed absorption stages between said gas inlet and outlet, each stage comprising:

(a) a ball bed

(b) a plurality of venturi tubes located below said ball bed through which gas is circulated upwardly from stage to stage;

(c) a piping system for circulating an absorption liquid at each stage, the level of said absorption liquid in each stage being maintained by overflow from stage to stage;

(d) a nozzle connected to said piping system and centered over each venturi tube pointing upwardly toward the ball bed for spraying absorption liquid into the ball bed to react the gas circulated through each stage with the absorption liquid; and

(e) means for capping each venturi tube to prevent the absorption liquid from dripping from stage to stage through the venturi tubes, said capping means including gas openings allowing gas to flow upwardly from stage to stage to be reacted with the absorption liquid in the ball bed of each stage.

4,619,814

PROCESS FOR THE RECOVERY OF NON-FERROUS METALS FROM SULPHIDE ORES AND CONCENTRATES

Robert S. Salter; Roy S. Boorman, both of Fredericton, Canada, and Igor A. E. Wilkomirsky, Concepcion, Chile, assignors to Provincial Holdings Ltd., Fredericton, Canada

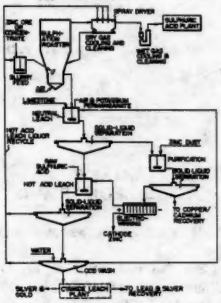
Continuation-in-part of Ser. No. 346,837, Feb. 5, 1982, Pat. No. 4,415,540, which is a continuation of Ser. No. 189,249, Sep. 22, 1980, Pat. No. 4,317,803, which is a continuation of Ser. No. 940,937, Sep. 11, 1978, Pat. No. 4,224,122. This application Sep. 7, 1983, Ser. No. 530,032

Claims priority, application Canada, Dec. 3, 1982, 416971

The portion of the term of this patent subsequent to Sep. 23, 1997, has been disclaimed.

Int. Cl.[4] C01G *3/10, 9/06*

U.S. Cl. 423—27 25 Claims



1. In a method for recovering zinc from material selected from the group consisting of sulphidic ores and concentrates and for rendering copper, lead, silver, and gold in said material more readily recoverable, the improvement comprising:

(a) roasting said material in a subdivided form in a fluidized bed reactor at a temperature from 620° to 700° C., with 20–60% excess air over the stoichiometric for an average retention time of over 1 hour at a superficial spacial velocity of the gas within the bed of 25–150 cm per sec at reactor temperature resulting in an atmosphere comprising SO_2, SO_3, water vapour, and remaining O_2 and N_2 from the air, to obtain a calcine containing zinc and copper as sulphates and oxysulphates, ferrites, oxides, and unreacted sulphides, iron as hematite, and lead, silver, and gold in forms amenable to recovery;

(b) leaching said calcine with water or dilute sulphuric acid solution at a temperature below 80° C. in such a manner that sulphates, oxysulphates, and oxides of zinc and copper are leached out from the calcine into the water or dilute sulphuric acid solution;

(c) subjecting the leach pulp resulting from step (b) to a liquid-solid separation step to yield a leach solution from which zinc and copper can be recovered;

(d) leaching the solid residue resulting from step (c) with hot, strong sulphuric acid solutions, at a temperature above 80° C. but below the boiling point of the solution and with sulphuric acid solution stronger than used in step (b), in such a manner that zinc and copper ferrites and unreacted sulphides of zinc and copper are converted to sulphates of iron, copper, and zinc which dissolve in the leach solution;

(e) subjecting the pulp resulting from step (d) to a solid-liquid separation step to obtain a leach solution containing said sulphates of iron, copper, and zinc;

(f) recycling said sulphates of zinc, copper, and iron obtained in step (e) in part into said fluidized bed reactor in a subdivided form to convert the sulphates of iron to hematite, SO_2 and SO_3 and render the sulphates of zinc and copper to the calcine for recovery by means of steps (b) and (c);

(g) washing the solid residue resulting from step (e) with water;

(h) subjecting any pulp resulting from step (g) to a solid-liquid separation step to obtain a washed leach residue containing lead, silver and gold in forms amenable to recovery and a wash liquor containing zinc, copper, and iron sulphates and sulphuric acid; and

(i) recycling said wash liquor resulting from step (h) in part to step (b) and/or in part to said fluidized bed reactor in a subdivided form to convert the sulphates of iron to hematite, SO_2 and SO_3 and enable recovery of the sulphates of zinc and copper by means of steps (b) and (c).

4,619,815

CHLORINATION OF IRON-CONTAINING METALIFEROUS MATERIAL

Michael Robinson, Wooton, England, assignor to SCM Chemicals Limited, London, England

Filed Sep. 30, 1985, Ser. No. 782,009

Int. Cl.[4] C01G *23/02, 23/047*

U.S. Cl. 423—74 13 Claims

1. A fluidized bed process for chlorinating iron-containing titaniferous ore to produce titanium dioxide beneficate and titanium chloride products, the process comprising:

providing a fluidized bed feed mixture comprising carbon and said titaniferous ore where said feed mixture contains by weight between 15% and 40% of said carbon;

maintaining the temperature of the fluidized bed at temperatures between 600° C. and 1150° C. by combusting a portion of said carbon with oxygen; and

chlorinating said fluidized bed with a quantity of chlorine between the quantity required to beneficiate said titaniferous ore without substantial chlorination of titanium dioxide and the quantity required to totally chlorinate said titaniferous ore to produce beneficate and titanium chloride products in the weight ratio between 0.70 and 0.30 of beneficiate/titanium chloride products.

4,619,816

RECOVERY OF COBALT FROM AMMONIACAL SOLUTIONS CONTAINING COBALT AND NICKEL

William A. Rickelton, Niagara Falls, Canada, assignor to American Cyanamid Company, Stamford, Conn.

Filed Nov. 21, 1985, Ser. No. 799,230

Int. Cl.[4] C22B *23/04*

U.S. Cl. 423—139 20 Claims

1. A process for the extraction of Co (III) from ammoniacal solutions comprising Co (III) and Ni (II), said process comprising:

(a) contacting said ammoniacal solution with

(b) bis (2,4,4-trimethylpentyl)phosphinic acid or an ammonium or alkali metal salt thereof,

said ammoniacal solution forming the aqueous phase and said phosphinic acid, or salt thereof, forming the organic phase, and

(c) a phase modifier

whereby the Co (III) values are extracted from said aqueous phase to said organic phase.

4,619,817

HYDROTHERMAL METHOD FOR PRODUCING STABILIZED ZIRCONIA

Edgel P. Stambaugh, Worthington; James H. Adair, Bexley; Ibrahim Sekercioglu, Dublin, and Roger R. Wills, Solon, all of Ohio, assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Mar. 27, 1985, Ser. No. 716,428

Int. Cl.[4] C01G *25/02*

U.S. Cl. 423—266 33 Claims

1. A process for the production of stabilized zirconia powders by hydrothermal treatment comprising:

a. providing an aqueous feedstock selected from the group consisting of zirconium nitrates, zirconium sulphates, zirconium chlorides, zirconium hydroxides, zirconium carbonates, zirconium acetates, zirconium oxides and zirconium ion containing solutions derived from the hydrothermal leach of zircon sand or baddeleyite with mineral acids;

b. adding and mixing a complexing agent with the feedstock, wherein the complexing agent forms (1) a stable soluble complex, (2) does not have side reactions resulting in undesirable products, (3) is capable of being removed from the final product, and (4) the complexing agent decomposes at hydrothermal conditions or has decreased affinity for the complexed ion;

c. mixing with the feedstock of b. at least one and mixtures thereof of materials selected from the group consisting of nitrates, sulphates, chlorides, hydroxides, carbonates, acetates, and oxides of yttrium, magnesium and calcium;

d. titrating the resulting mixture to a pH≧9 with a base in a manner adapted to prevent precipitation of a hydrous oxide;

e. treating the titrated mixture at hydrothermal conditions adapted to produce a stabilized zirconia precipitate; and

f. separating the stabilized zirconia precipitate from the mixture.

4,619,818

CRYSTALLINE ANTIMONOPHOSPHOALUMINATE

Eric G. Derouane, Namur, Belgium, and Roland von Ballmoos, Hopewell, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 615,495, May 30, 1984, abandoned. This application Apr. 1, 1985, Ser. No. 718,269

Int. Cl.[4] C01B *25/36*

U.S. Cl. 423—306 **8 Claims**

1. A synthetic crystalline material comprising antimony, phosphorus and aluminum which, as synthesized, exhibits a characteristic X-ray diffraction pattern as shown in Table 1 of the specification, and a composition as follows:

$$A_v:Q^{q+}$$

$$i/q|^{q+}:(AlO_2^-)_{1-x}:(PO_2^+)_{1-y}:MO_2^{m-4})_x\cdot$$

$$+y:T_{|j/t|}{}^{t-}$$

wherein A is occluded organic directing agent and solvent, v is the number of moles of A, Q is a cation of valence q, M is one or more elements of valence m selected from the group consisting of Sb^{+3} and combintation thereof with Si^{+4}, and wherein less than 50% of the atoms of M are Si^{+4}, T is an anion of valence t, and x, y, i and j are numbers which satisfy the relationships:

$$z=i-j, \text{ and}$$

$$z=y-x+(4+m)\cdot(x+y)$$

wherein z is a number of from greater than -1 to less than $+1$, and which further exhibits a TPAD peak of less than 200° C. when in the ammonium form.

4,619,819

PHOSPHORIC ACID COMPOSITION

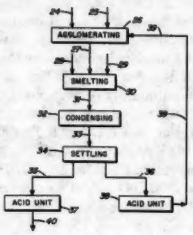
James C. Barber, Florence, Ala., assignor to James C. Barber and Associates, Inc., Florence, Ala.

Continuation-in-part of Ser. No. 301,378, Sep. 11, 1981, Pat. No. 4,383,874, which is a division of Ser. No. 223,122, Jan. 7, 1981, Pat. No. 4,372,929. This application Jun. 10, 1983, Ser. No. 503,099

Int. Cl.[4] C01B *25/16*

U.S. Cl. 423—317 **3 Claims**

1. A composition of phosphoric acid which comprises not less than about 99.98 percent by weight phosphoric acid with a tripolyphosphoric acid content greater than about 20 percent by weight a F/P_2O_5 weight ratio in the range of 0.000120 to



PROCESS FOR MAKING PHOSPHORIC ACID WITH LOW IMPURITIES CONTENT

0.000140 and a total metals/P_2O_5 weight ratio in the range of 0.00060 to 0.00080.

4,619,820

SYNTHESIS OF ZSM-23 ZEOLITE AND THE PRODUCT PRODUCED

Ernest W. Valyocsik, Yardley, Pa., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation of Ser. No. 661,759, Oct. 17, 1984, abandoned, which is a continuation-in-part of Ser. No. 490,083, Apr. 29, 1983, Pat. No. 4,490,342, and a continuation-in-part of Ser. No. 490,084, Apr. 29, 1983, Pat. No. 4,531,012. This application Dec. 13, 1985, Ser. No. 808,367

The portion of the term of this patent subsequent to Dec. 25, 2001, has been disclaimed.

Int. Cl.[4] C01B *33/28*

U.S. Cl. 423—328 **18 Claims**

1. A process for preparing a ZSM-23 zeolite having an X-ray diffraction pattern of Table I, comprising preparing a reaction mixture which comprises sources of an alkali metal, an oxide of aluminum (Al_2O_3), an oxide of silicon (SiO_2), water and a nitrogen-containing organic cation R^+ and having the following composition, in terms of mole ratios:

SiO_2/Al_2O_3=5000 to ∞

H_2O/SiO_2=5 to 200

OH^-/SiO_2=0 to 0.60

M^+/SiO_2=0.01 to 2.0

R^+/SiO_2=0.01 to 2.0

wherein M^+ is a cation of an alkali or alkaline earth metal and R^+ is an organic cation of the formula $(CH_3)_3N^+—R_1—N^+(CH_3)_3$ wherein R_1 is a saturated or unsaturated straight chain hydrocarbon group having seven carbon atoms, and maintaining the mixture at crystallization conditions until crystals of the ZSM-23 zeolite are formed.

8. A synthetic crystalline ZSM-23 zeolite material in the as-synthesized form having a formula, in terms of moles of oxides, in the anhydrous state:

$$(0.01\text{–}6)R_2O:(0\text{–}2)M_{2/n}O:(x)Al_2O_3:(100)SiO_2$$

wherein R_2O is an oxide of a promoter, organic or inorganic salt thereof, the promoter being a cation of the formula

$$(CH_3)_3N^+—R_1—N^+(CH_3)_3$$

wherein R_1 is a saturated or unsaturated straight chain hydrocarbon group having seven carbon atoms and M is an alkali or alkaline earth metal having a valence n, and x ranges from about 0.005 to 0.02.

4,619,821

OZONE DECOMPOSITION

Stephen R. Ely, Naperville, Ill., assignor to Amoco Corporation, Chicago, Ill.

Filed Dec. 2, 1985, Ser. No. 803,588
Int. Cl.[4] B01D *53/36*
U.S. Cl. 423—579 13 Claims

1. A process to decompose ozone which comprises passing an ozone-containing gas through a catalyst comprised of an AMS-1B crystalline borosilicate catalyst.

4,619,822

NOVEL PROCESS FOR THE SYNTHESIS OF VANADIUM OXIDE, V_6O_{13}

Abdelkader Hammou, Grenoble; Philippe Rigaud, Vienne, and Catherine Rousseau, La Roche sur Yon, all of France, assignors to Societe Nationale Elf Aquitaine, Courbevoie, France

Filed Apr. 24, 1985, Ser. No. 726,621
Claims priority, application France, Apr. 24, 1984, 84 06415
Int. Cl.[4] C01G *31/02*
U.S. Cl. 423—592 5 Claims

1. In a process for preparing V_6O_{13} by reducing V_2O_5 at high temperatures, the improvement comprising reducing V_2O_5 with a gaseous mixture of carbon monoxide and carbon dioxide to obtain substantially pure V_6O_{13}, wherein the said gaseous mixture contains between 5 and 15 percent by volume of carbon monoxide.

4,619,823

RADIOACTIVE IODINE LABELED METARAMINOL AND DIAGNOSTIC AGENT CONTAINING PLATELETS LABELED THEREWITH

Akira Yokoyama, Ohtsu, and Yoshiro Ohmomo, Kyoto, both of Japan, assignors to Nihon Medi-Physics Co., Ltd., Hyogo, Japan

Filed Dec. 22, 1983, Ser. No. 564,653
Claims priority, application Japan, Sep. 9, 1983, 58-167339
Int. Cl.[4] A61K *43/00, 49/00;* C07C *131/00*
U.S. Cl. 424—1.1 5 Claims

1. Metaraminol labeled with radioactive iodine by replacement of at least one hydrogen in the metaraminol benzene ring.

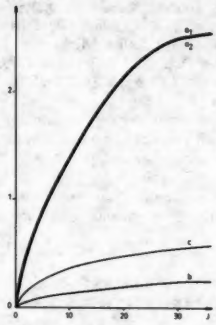
4,619,824

METHOD FOR REDUCING THE WATER DESORPTION OF AN ACTIVE COMPOSITION CARRIED BY A SUPPORTING MEDIUM

Richard Weiss, Chartres, and Hubert Delagneau, Mainvilliers, both of France, assignors to Reckitt & Colman, S.A., Massy Cedex, France

PCT No. PCT/FR83/00042, § 371 Date Nov. 3, 1983, § 102(e) Date Nov. 3, 1983, PCT Pub. No. WO83/03056, PCT Pub. Date Sep. 15, 1983
PCT Filed Mar. 4, 1983, Ser. No. 556,245
Claims priority, application France, Mar. 4, 1982, 82 03599
Int. Cl.[4] A61L *9/01, 9/04*
U.S. Cl. 424—16 15 Claims

1. A process for reducing desorption by and into water of a liquid active chemical composition carried by a substrate when such an assembly is in contact with an aqueous medium, said process comprising treating at least one of the composition or the substrate with at least one compatible polar compound which provides the substrate or said composition an opposite ionic charge to that of the other, or increases the ionic charge between the composition and the substrate if such charge is already opposite to that of the other, and simultaneously provides a hydrophilic/lipophilic balance (HLB) such that the



surface tension of the substrate/composition couple is lower than the surface tension of the substrate/water couple.

4,619,825

CONTROL OF DENTAL PLAQUE AND CARIES

Edward Eigen, East Brunswick, and Alexander J. Simone, Somerset, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Filed Apr. 18, 1985, Ser. No. 724,376
Int. Cl.[4] A61K *7/16*
U.S. Cl. 424—49 6 Claims

1. A method for inhibiting dental plaque and promoting caries reduction in oral hygiene comprising dispersing an effective plaque inhibiting and caries-reducing amount of emulsan in water and contacting the aqueous dispersion of emulsan with dental surfaces susceptable to caries generally recognized to be caused by Streptococcus mutans as well as to growth of dental plaque through inhibition of attachment of *S. mutans*, as well as by desorbing *S. mutans* that have previously attached to dental surfaces in a mammalian oral cavity.

4,619,826

ACNE CONTROL METHOD

George E. Lay, Fountaintown; Richard A. Knipstein, Carmel, both of Ind., and Daniel H. Haigh, Sanford, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 497,296, May 23, 1983, Pat. No. 4,489,058. This application Dec. 7, 1984, Ser. No. 679,173
The portion of the term of this patent subsequent to Dec. 18, 2001, has been disclaimed.
Int. Cl.[4] A61K *31/78, 31/74, 31/745*
U.S. Cl. 424—78 18 Claims

1. A method for controlling acne or acneform eruptions in humans which comprises the topical application of an effective amount of a crosslinked or uncrosslinked sebum-imbibing, sebum-retaining polymer; said polymer being the polymerization product of at least four monomer units selected from the group consisting of styrene; styrene ring substituted with a straight or branched chain alkyl moiety of from 1 to about 12 carbon atoms; an alkyl ester derived from an alcohol containing from about 8 to about 20 carbon atoms and acrylic or methacrylic acid; a vinyl ester of an aliphatic carboxylic acid containing from about 8 to about 20 carbon atoms; and an aliphatic diolefin of from about 4 to about 6 carbon atoms.

4,619,827

METHOD FOR ADMINISTERING EQUINE VACCINES AND COMPOSITIONS THEREFOR

Robert W. Bull, Haslett; Robert M. Soltysiak, and Paul D. Minnick, both of East Lansing, all of Mich., assignors to Neogen Corporation, Lansing, Mich.

Filed Oct. 7, 1985, Ser. No. 785,001
Int. Cl.[4] A61K *39/12, 45/02*
U.S. Cl. 424—89 17 Claims

1. In a method for providing an immune response to an equine disease with a viral or viral subunit or other viral-derived antigen vaccine which produces a blood serum improvement which comprises:

administering an equine leukokine with the vaccine to thereby provide an enhanced immune response in the equine.

4,619,828

POLYSACCHARIDE EXOTOXOID CONJUGATE VACCINES

Lance K. Gordon, Newmarket, Canada, assignor to Connaught Laboratories, Inc., Swiftwater, Pa.

Continuation-in-part of Ser. No. 395,743, Jul. 6, 1982, Pat. No. 4,496,538. This application Jan. 5, 1984, Ser. No. 568,453
The portion of the term of this patent subsequent to Jan. 29, 2002, has been disclaimed.
Int. Cl.[4] A61K *39/108, 39/09, 39/385, 39/102;* C07K *15/00*
U.S. Cl. 424—92 13 Claims

1. A water-soluble, heat resistant conjugate of a polysaccharide, obtained from a pathogenic bacterial organism, covalently bound to a T-cell dependent antigen

capable of producing a T-cell dependent antibody response to polysaccharides from the said organism

of molecular size above 140,000 and below 4,500,000 daltons as referenced to dextran standard by gel permeation chromatography, and

having a polysaccharide/protein ratio between 0.25 and 2, prepared by mixing a T-cell dependent antigen with a spacer compound of the formula X-B-X, wherein B is a C^{4-8} alkylene in which a $—CH_2—$ linkage can optionally be replaced by an —O— linkage and wherein X is a nucleophilic group capable of reacting with said antigen,

mixing the resulting derivatized antigen with an electrophilically activated polysaccharide obtained from the said bacterial organism, which polysaccharide had previously been sized by heating until more than 60% of the polysaccharide was adjusted to a molecular size between 200,000 and 2,000,000 dalton as referenced to dextran standard by gel permeation chromatograpy.

4,619,829

UTILIZATION OF A SINGLE VITAMIN OR A COMBINATION OF VARIOUS VITAMINS

Georges Motschan, Schönbeinstrasse 21, 4056 Basel, Switzerland

PCT No. PCT/CH83/00127, § 371 Date Jul. 13, 1984, § 102(e) Date Jul. 13, 1984, PCT Pub. No. WO84/01899, PCT Pub. Date May 24, 1984
PCT Filed Nov. 16, 1983, Ser. No. 631,555
Claims priority, application Switzerland, Nov. 16, 1982, 6682/82
Int. Cl.[4] A61K *31/525, 33/42*
U.S. Cl. 424—128 9 Claims

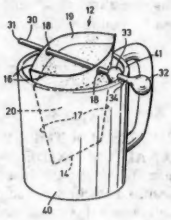
1. A method for the treatment of polyarthritis which comprises the administration for a period of time of at least 5 months of an anti-arthritic effective amount of a vitamin composition comprising the combination of (a) about 0.15 to 0.5 mg of biotin, (b) about 5 to 20 mg of vitamin B_1, (c) about 2 to 15 mg of vitamin B_2, (d) about 20 to 50 mg of nicotinamide, (e) about 2 to 10 mg of vitamin B_6, (f) about 4 to 10 ug of vitamin B_{12} and about 3 to 25 mg of pantothenic acid or the alcohol or calcium salt thereof.

4,619,830

BEVERAGE FILTER UNIT AND SUPPORT

Edward D. Napier, 45 Faraday Drive, Scarborough, Ontario, Canada (M1H 2R9)

Filed Aug. 2, 1984, Ser. No. 637,001
Int. Cl.[4] B65B *29/02;* B30B *5/02*
U.S. Cl. 426—82 10 Claims



8. A filter unit that can be suspended in a cup, comprising a water permeable pouch for retention of ground coffee, tea or other beverage flavoring, the pouch when empty lying flat and having a bottom fold line and opposite side edges which diverge upwardly to a mouth portion of the pouch, the divergent edges being adapted, when the pouch is lowered into the cup, to engage opposite sides of the cup thereby to urge the mouth portion to open, and a rod insertable through the pouch transversely across its mouth portion midway between said side edges substantially perpendicular to the fold line and adapted to rest transversely of the rim of the cup to support the pouch in the cup.

4,619,831

DIETARY FIBER COMPOSITION AND PROCESS OF MANUFACTURE

Shri C. Sharma, Mendham, N.J., assignor to Warner-Lambert Company, Morris Plains, N.J.

Filed Jun. 4, 1984, Ser. No. 616,993
Int. Cl.[4] A23L *1/29*
U.S. Cl. 426—93 15 Claims

8. A process for making a coated or enrobed dietary fiber composition comprising:

(a) preparing an insoluble concentrated dietary fiber free of digestible compounents by removing the digestible portions of a cereal bran with a solvent to chemically defat the insoluble dietary fiber; and subsequently treating the defatted fiber enzymatically to remove protein and carbohydrates;

(b) recovering the concentrated concentrated insoluble fiber;

(c) coating or enrobing the concentrated insoluble fiber with a soluble dietary fiber using an aqueous medium, said soluble dietary selected from the group consisting of alginates, gums, pectin, mucillages, plant exudates, fermentation products, synthetic hydrocolloids and mixtures thereof and used in an amount sufficient to mask the fibrous, rough mouthfeel texture of the concentrated insoluble dietary fiber;

(d) removing excess water by drying to yield the coated fiber composition.

4,619,832

FORMING AND CONVEYING OF BAKED CONFECTION SHELLS

Thomas H. Lutsey, and Vernon L. Bero, both of Green Bay, Wis., assignors to Gold Bond Ice Cream, Inc., Green Bay, Wis.

Division of Ser. No. 600,764, Apr. 16, 1984, Pat. No. 4,534,722.
This application Apr. 12, 1985, Ser. No. 722,680
Int. Cl.[4] A21D *13/00*
U.S. Cl. 426—302 4 Claims

1. A method of forming and conveying hot baked shells for use in confections and with said shells being initially soft and of disc shape, comprising the steps of:

(a) initially picking up said discs in succession from a baking means and feeding said discs in a longitudinal direction,

(b) then forming said fed discs into lap folded taco-shaped shells having generally parallel spaced legs joined by a folded portion,

(c) then feeding said formed shells onto an elongated fixed conveyor rail so that said shells hang therefrom,

(d) then frictionally engaging and sliding said hanging shells progressively along said fixed rail toward a discharge point,

(e) and supplying cooling fluid to the interior of said rail as said shells slide therealong to thereby cool said shells.

4,619,833

PROCESS FOR PRODUCING A RAPIDLY WATER-SOLUBLE, FREE-FLOWING, SUGAR-FREE DRY BEVERAGE MIX

Del M. Anderson, Port Hope, Canada, assignor to General Foods Inc., Coubourg, Canada

Continuation of Ser. No. 681,401, Dec. 13, 1984, abandoned.
This application Dec. 3, 1985, Ser. No. 804,702
Int. Cl.[4] A23L *1/236, 2/00*
U.S. Cl. 426—548 15 Claims

1. A process for preparing a rapidly water-soluble, free-flowing, substantially sugar-free dry beverage mix comprising the ingredients of at least one food acid, at least one flavor and at least one flow conditioner, the steps comprising a first intimate dry mixing of the coarse particles of at least one rapid water-soluble food acid with the finely divided particles of at least one slow water-soluble flow conditioner to obtain a substantially uniform dispersion of said rapidly water-soluble food acid and said slow water-soluble flavor and conditioner and a second intimately dry mixing of the said uniform dispersion composition of the first mixing step with a maltodextrin having coarse particles and a dextrose equivalency in the range from about 5 to about 20, said mixing continued until the resulting product is water-soluble, said coarse particles being of a size wherein 100% pass through a U.S. screen size of 10 mesh and up to about 95% remains on a U.S. screen size of 100 mesh and said finely divided particles being of a size wherein 100% pass through a U.S. screen size of 20 mesh and up to about 75 to 100% through a U.S. screen size of 100 mesh and about 40 to 100% through a U.S. screen size of 200 mesh.

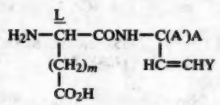
4,619,834

SWEETENING WITH L-AMINODICARBOXYLIC ACID AMINOALKENOIC ACID ESTER AMIDES

Paul R. Zanno, Nanuet; Ronald E. Barnett, Suffern, and Glenn M. Roy, Garnerville, all of N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Division of Ser. No. 730,970, May 6, 1985, Pat. No. 4,571,308.
This application Nov. 5, 1985, Ser. No. 795,378
Int. Cl.[4] A23L *1/236*
U.S. Cl. 426—548 7 Claims

1. An edible composition containing a sweetening effective amount of a compound represented by the formula:



wherein

A is CO_2R in which R is alkyl containing 1–3 carbon atoms;

A′ is hydrogen or alkyl containing 1–3 carbon atoms;

Y is $-(CHR_2)_n-R_1$ or $-CHR_3R_4$;

R_1 is alkyl-substituted cycloalkyl, cycloalkenyl, bicycloalkyl or bicycloalkenyl containing at least one alkyl in the β-position of the ring, up to 7 ring carbon atoms and up to a total of 12 carbon atoms;

R_2 is H or alkyl containing 1–4 carbon atoms;

R_3 and R_4 are each cycloalkyl containing 3–4 ring carbon atoms;

n=0, or 1; and

m=0 or 1;

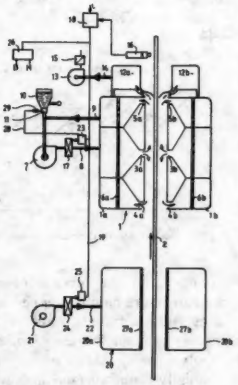
and food-acceptable salts thereof.

4,619,835

OPTIMIZING PROCESS AND DEVICE IN A PROCESS FOR REDUCING THE SIZE OF THE FLOWERING OF A GALVANIZED STEEL STRIP

Bernard Francois, Creil, France, assignor to Usinor, Puteaux, France

Filed Jun. 14, 1985, Ser. No. 744,578
Claims priority, application France, Jun. 22, 1984, 84 09910
Int. Cl.[4] B05B *7/00*; B05C *5/00, 11/00, 19/00*
U.S. Cl. 427—8 8 Claims



1. A process for optimizing solidification of zinc on a steel strip comprising employing germs of crystallization constituted by zinc in the form of a fine powder, blowing said germs by means of a conveying fluid inside a spraying case onto opposite sides of the strip, measuring the temperature of the

strip adjacent a strip exit of the spraying case, and maintaining said temperature at an optimal value by regulating the rate of flow of said blown fluid as a function of the difference between the measurement of the obtained temperature and an optimal temperature for said process.

4,619,836

METHOD OF FABRICATING THICK FILM ELECTRICAL COMPONENTS

Ashok N. Prabhu, East Windsor Township; Edward J. Conlon, and Franco N. Sechi, both of Princeton Township, all of Mercer County, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Dec. 31, 1985, Ser. No. 815,076
Int. Cl.[4] H05K *3/12*
U.S. Cl. 427—41 **6 Claims**

1. A method for fabricating a thick film electrical component on the surface of a substrate comprising the steps of:

(a) providing a thick film ink composition comprised of (i) an organic vehicle which is reactive with a suitable plasma to form gaseous reaction products at a temperature below the thermal decomposition temperature of the organic vehicle, (ii) a glass frit having a glass transition temperature above the thermal decomposition temperature of the organic vehicle, and (iii) a particulate material for imparting a predetermined electrical property to the electrical component;

(b) forming a patterned layer of the thick film ink on the surface of the substrate;

(c) subjecting the layer to a suitable plasma at a temperature below the thermal decomposition temperature of the organic vehicle for a time sufficient to remove the organic vehicle from the layer; and

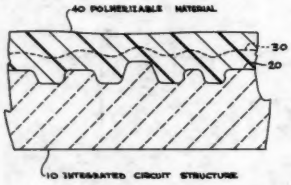
(d) firing the resulting layer of glass frit and particulate material at or above the glass transition temperature of the glass frit until the glass frit fuses.

4,619,837

POLYMERIZABLE PLANARIZATION LAYER FOR INTEGRATED CIRCUIT STRUCTURES

Andrew V. Brown, San Jose, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Feb. 1, 1985, Ser. No. 697,363
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—44 **15 Claims**



1. An improvement in the process of manufacturing an integrated circuit structure having stepped topography which comprises coating said integrated circuit structure with a polymerizable monomer without the use of substantially any solvents and then polymerizing said monomer on said structure to provide a substantially planar surface on said integrated circuit structure, whereby the volume change of said polymerizable monomer, as said monomer is polymerized from a flowable monomer to a solid material, is materially reduced to permit maintenance, during polymerization, of the substantially planar surface obtained while applying said monomer to said integrated circuit structure.

4,619,838

PROCESS FOR THE DEPOSITION OF METALS ON SEMICONDUCTOR POWDERS

Kurt Meier, Allschwil; Niklaus Bühler, Rheinfelden, and Jean-Francois Reber, Riehen, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 666,127, Oct. 30, 1984, Pat. No. 4,559,237, which is a continuation of Ser. No. 456,888, Jan. 10, 1983, abandoned. This application Sep. 26, 1985, Ser. No. 780,158
Claims priority, application Switzerland, Jan. 15, 1982, 241/82
Int. Cl.[4] B05D *3/06*
U.S. Cl. 427—53.1 **11 Claims**

1. A process for the deposition of copper, lead, mercury, tin, gold, silver, palladium, osmium, cadmium or mixtures thereof on a semiconductor sulfide powder selected from the group consisting of Zns and Bi_2S_3, which process comprises

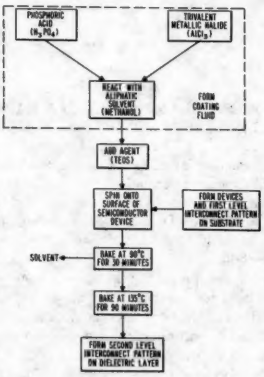
irradiating a suspension of said semiconductor powder in an open system, in the presence of oxygen, CO_2 or mixtures thereof, of an oxidizable medium, which protects the semiconductor from photocorrosion, and of a copper, lead, mercury, tin, gold, silver, palladium, osmium, cadmium salt or complex, or mixture thereof.

4,619,839

METHOD OF FORMING A DIELECTRIC LAYER ON A SEMICONDUCTOR DEVICE

William I. Lehrer, Los Altos, Calif., assignor to Fairchild Camera & Instrument Corp., Mountain View, Calif.

Filed Dec. 12, 1984, Ser. No. 680,878
Int. Cl.[4] H01L *21/316*
U.S. Cl. 427—82 **18 Claims**


PHOSPHORIC ACID (H_3PO_4)
TRIVALENT METALLIC HALIDE ($AlCl_3$)
REACT WITH ALIPHATIC SOLVENT (METHANOL)
FORM COATING FLUID
ADD AGENT (TEOS)
SPIN ONTO SURFACE OF SEMICONDUCTOR DEVICE
FORM DEVICES AND FIRST LEVEL INTERCONNECT PATTERN ON SUBSTRATE
SOLVENT
BAKE AT 80°C FOR 30 MINUTES
BAKE AT 135°C FOR 90 MINUTES
FORM SECOND LEVEL INTERCONNECT PATTERN ON DIELECTRIC LAYER

1. A method of forming a substantially planar layer of an electrically insulating material over electrical interconnect topography on a semiconductor device, said method comprising the steps of:

(a) reacting phosphoric acid and a trivalent metallic halide compound with an aliphatic solvent to form a coating fluid;

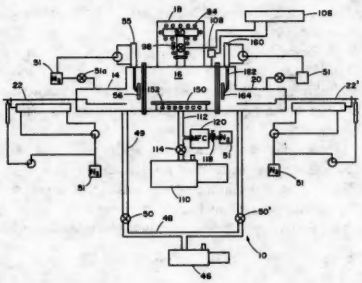
(b) spinning said coating fluid onto a surface of said semiconductor device to form a layer over said interconnect topography; and

(c) heating at least said layer to at least a first predetermined temperature for at least a first predetermined period of time.

4,619,840
PROCESS AND APPARATUS FOR LOW PRESSURE CHEMICAL VAPOR DEPOSITION OF REFRACTORY METAL

Jon C. Goldman, Orange; Michael A. Fisk, Anaheim, and Michael Diem, Orange, all of Calif., assignors to Thermco Systems, Inc., Orange, Calif.

Filed May 23, 1983, Ser. No. 497,321
Int. Cl.[4] H01L *21/285*
U.S. Cl. 427—91 **13 Claims**

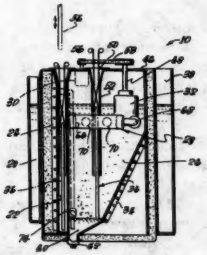


1. A process for low pressure chemical vapor deposition of a refractory metal thin film on a semiconductor substrate comprising the steps of: placing a semiconductor substrate in a deposition chamber; evacuating said deposition chamber; heating said semiconductor substrate to a temperature exceeding that at which a refractory metal carbonyl compound dissociates; heating said refractory metal carbonyl compond sufficiently to convert a portion of it to a refractory metal carbonyl vapor; continuously flowing said refractory metal carbonyl vapor into contact with the heated semiconductor substrate at subatmospheric pressure for a time sufficiently long to deposit a layer of a refractory metal from said refractory metal carbonyl vapor by means of exhausting said deposition chamber with a vacuum pumping means to maintain a substantially constant amount of said refractory metal carbonyl vapor within said deposition chamber; and removing said semiconductor substrate from said deposition chamber.

4,619,841
SOLDER LEVELER

Thomas E. Schwerin, 2131 N. 1st St., Flagstaff, Ariz. 86001

Filed Sep. 13, 1982, Ser. No. 417,428
Int. Cl.[4] B23K *1/08*; B05D *5/12*
U.S. Cl. 427—96 **17 Claims**



1. Apparatus for removing excess solder from a printed circuit board containing conductive paths and plated through-holes and the like, comprising:

a container for retaining liquid flux,

a container for retaining heated liquid solder,

a container for retaining a heat transfer medium,

a ribbon flow manifold assembly immersed in the heat transfer medium to produce forcefully directed, Venturi effect-enhanced laminar flows through said medium to simultaneously impinge upon each side of a soldered printed circuit board, thereby stripping excess solder from the conductive paths and plated through-holes of said printed circuit board, and wherein the ribbon flow manifold assembly contains two parallel ribbon tube elements separated at their respective closest proximity by a distance commensurate with the development of Venturi effect enhanced, laminar flows through the heat transfer medium, each ribbon tube element having a continuous longitudinal slot of width that is small with respect to the wall thickness of each of said ribbon tube elements and of length sufficient to span the width of the printed circuit board, said slots being oriented in rotation about the longitudinal axes of said ribbon tube elements such that flow through said slots are adjustably directed downwardly at an angle of between 5 and 45 degrees from direct opposition with each other, and

pump means to drive said medium into said manifold assembly.

16. A process for treating printed circuit boards and the like to solder and then to remove excess solder from such boards and plated through-holes therein comprising:

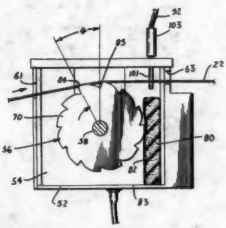
suspending a flat sided substrate, having a pattern of conductive paths thereon and plated through-holes therein, and sequentially immersing such substrate into a flux solution, thence into a liquid solder, and

thence into a heat transfer medium bath wherein is implemented a uniform and controlled Venturi effect-enchanced laminar flow of heat transfer medium within the volume of said heat transfer medium, such flow being adjustably angled downwardly from direct normal impingement upon the sides of the substrate as said substrate is immersed and removed from the heat transfer medium bath and such flow being longitudinally continuous across the width of the substrate.

4,619,842
METHODS OF AND APPARATUS FOR MARKING ELONGATED STRAND MATERIAL

Parry A. Moss, and Francis A. Rotoloni, both of Norcross, Ga., assignors to AT&T Technologies, Inc., Berkeley Heights, N.J.

Filed Mar. 28, 1985, Ser. No. 717,205
Int. Cl.[4] B05D *5/00*; B05C *1/16*
U.S. Cl. 427—163 **11 Claims**



1. A method of marking an elongated strand material, said method comprising the steps of:

advancing an elongated strand material along a path of travel;

providing a liquid marking material in a controlled manner to a porous, resilient supply member;

mounting an applicator member having grooved portions spaced along the periphery thereof for movement of the grooved portions of the applicator member between the

path of travel of the elongated strand material and engagement with the supply member such that increments of length of the advancing strand material are received in and then removed from the grooves; and

moving the applicator member to engage in seriatim the spaced portions of the applicator member compressively with the supply member and cause liquid marking material to be transferred from the supply member to the groove of each portion, and to transfer the liquid marking material from the groove of each portion to a predetermined peripheral portion of increments of length of the advancing strand material.

5. An apparatus for marking an elongated strand material, said apparatus comprising:

moving means for advancing an elongated strand material along a path of travel;

porous, resilient supply means for holding a liquid marking material;

at least one applicator member having spaced portions of its periphery each provided with a groove;

means for mounting said applicator member for movement of portions of the applicator member between the path of travel of the elongated strand material and engagement with the supply means such that increments of length of the advancing strand material are received in and then removed from each groove; and

means for moving the applicator member to engage compressively said spaced portions of the applicator member with the supply means and cause liquid marking material to be transferred from the supply means to the groove of each spaced portion and to transfer the liquid marking material from each groove to a predetermined peripheral portion of increments of length of the advancing strand material.

4,619,843

PROCESS FOR THE PREPARATION OF GRANULES

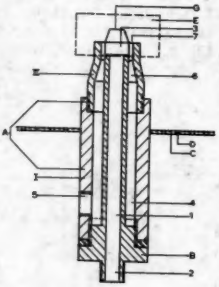
Stanislaus M. P. Mutsers, Geleen, Netherlands, assignor to Unie van Kunstmestfabrieken B.V., Utrecht, Netherlands

Filed Aug. 21, 1984, Ser. No. 643,025

Claims priority, application Netherlands, Aug. 27, 1983, 8302999

Int. Cl.⁴ B05D *1/02*

U.S. Cl. 427—213 **10 Claims**



1. A process for the preparation of solid granules from a liquid material which process comprises the steps of:

(1) forming and maintaining in a vessel, and above a feeding device therein, a fluidized bed of solid particulate nuclei by upwardly flowing a first low velocity fluidizing gas stream through said bed, said feeding device comprising:

(a) a first central conduit for delivering an upward flow of starting liquid material into said vessel from the exit of said first conduit in the form of a virtually closed conical film,

(b) said first central conduit including means for imparting a horizontal velocity component to said starting liquid prior to its exit, and

(c) a second concentric conduit annularly disposed about said first conduit for delivering an upward flow of a second gas stream into said vessel from the exit of said second conduit;

(2) introducing said starting liquid into said vessel through said first central conduit at velocity sufficient to form said cone,

(3) introducing, through said concentric annular conduit, said second gas stream into said vessel at an initially high velocity relative to the velocity of said first gas stream thereby forming a rarified zone of solid nuclei above the said exits of said conduits, whereby

(a) there is formed a virtually closed conical film of said liquid within said rarified zone, and

(b) said solid nuclei are entrained in said second gas stream before said second gas stream hits said conical film, so that

(c) said entrained solid nuclei impact with said conical film thereby moistening said solid nuclei, and

(d) the liquid material taken up by the nuclei is allowed to solidify causing the solid nuclei to grow in size, and

(4) thereafter removing the thus obtained granules from said vessel.

4,619,844

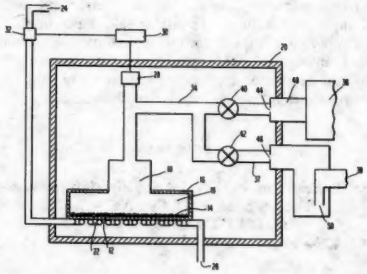
METHOD AND APPARATUS FOR LOW PRESSURE CHEMICAL VAPOR DEPOSITION

John M. Pierce, Palo Alto, and William I. Lehrer, Los Altos, both of Calif., assignors to Fairchild Camera Instrument Corp., Mountain View, Calif.

Filed Jan. 22, 1985, Ser. No. 693,401

Int. Cl.⁴ C23C *16/00*; B05C *11/00*

U.S. Cl. 427—248.1 **16 Claims**



1. A method of introducing a controlled flow of vapor from a high pressure sublimation chamber into a low pressure vapor deposition reactor, said vapor being derived from solid source material having a vapor pressure above about one (1) Torr at a temperature not exceeding about 350° C., said method comprising:

(a) heating the source material in the sublimation chamber to a temperature sufficient to produce vapor therefrom at a desired pressure;

(b) transferring said vapor to said reactor through a valved orifice of vapor transmission means, at which orifice, the pressure of the vapor can be substantially reduced to produce a controllable flow of vapor nearly proportional to the pressure in the sublimation chamber; and

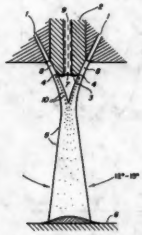
(c) maintaining said vapor transmission means at a temperature sufficient to prevent condensation of the vapor therein during transfer.

4,619,845

METHOD FOR GENERATING FINE SPRAYS OF MOLTEN METAL FOR SPRAY COATING AND POWDER MAKING

Jack D. Ayers, Oakton, and Iver E. Anderson, Alexandria, both of Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 22, 1985, Ser. No. 704,117
Int. Cl.[4] B05D 1/02
U.S. Cl. 427—422 10 Claims



1. A method for generating a supersonic spray of atomized metal droplets, employing a melt nozzle having an exterior surface portion in the shape of the frustrum of a cone with a melt tube orifice at the center of the nozzle and with a plurality of gas jets coaxial to the nozzle flowing over said exterior surface portion, comprising the steps of:

(a) liquifying metal and allowing it to flow into the melt tube orifice;

(b) positioning the respective gas jets over circularly-spaced portions of the exterior surface portion so that a vector describing the direction of each gas jet has a positive first component in the same direction as the direction of metal flow from the melt tube orifice and a positive second component perpendicular to the direction of metal flow from the melt tube orifice;

(c) establishing the input pressure to the gas jets at a pressure in excess of 1000 psig sufficient such that a pressure comes to exist at the melt tube orifice that is of smaller magnitude than that which exists when the gas jets are at zero input pressure; and,

(d) adjusting the relative magnitudes of said first component and said second component of the gas jet direction vectors such that a spray having supersonic speed is produced.

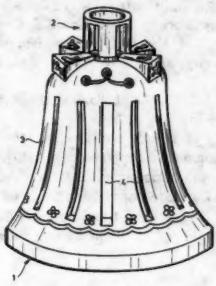
4,619,846

BELL

Edit Oborzil, and Tibor Jeney, both of Jegenye u. 25., 1221 Budapest, Hungary

Filed May 15, 1985, Ser. No. 734,447
Claims priority, application Hungary, Jul. 3, 1984, 2574/84
Int. Cl.[4] G10K 1/00
U.S. Cl. 428—11 2 Claims

1. Bell made of aluminium or aluminium alloy, comprising a mantle, fully broken-through gaps (4) formed in the mantle for tuning said bell to at least a predetermined frequency range of tone, said gaps being formed along the periphery of said mantle and being separated from one another by spaces, said gaps running essentially parallel with the longitudinal axis of the bell mantle and following the shape of the bell mantle, wherein the centerlines of the gaps (4) lie in planes containing the longitudinal axis of the bell and when viewed from any point of said planes the gaps show a straight or arcuate pattern, wherein the width of the gaps and the space between two adjacent gaps



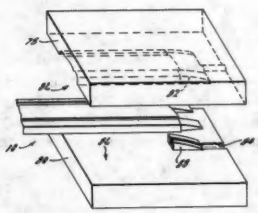
are of different magnitude and, wherein the gaps are of different length.

4,619,847

TRIM STRIP HAVING INJECTION MOLDED FINISHING PORTION AND METHOD OF MAKING

Norman C. Jackson, Livonia, Mich., assignor to The Standard Products Company, Cleveland, Ohio

Filed Mar. 20, 1984, Ser. No. 589,931
Int. Cl.[4] B60R 13/02; B29C 45/14
U.S. Cl. 428—31 14 Claims



1. A trim strip having a finished end made by:

providing a trim strip;

cutting an end portion of said trim strip in an axial direction using an end die cutter;

cutting said end portion of said trim strip in a transverse direction to form a least one projecting finger using a transverse die cutter;

placing said projecting finger of said end portion of said trim strip into an injection molding die having an internal cavity and clamping said trim strip end portion into said injection molding die;

injecting thermoplastic material within said cavity of said die such that said material contacts and bonds to said finger and forms an end cap thereover; and

withdrawing the finished trim strip from said die.

4,619,848

COMPOSITIONS AND METHODS FOR SEALING CONTAINERS

John R. Knight, and Geoffrey R. Thwaites, both of Cambridge, England, assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Apr. 9, 1984, Ser. No. 598,145

Claims priority, application United Kingdom, Apr. 25, 1983, 8311138

Int. Cl.[4] C08L *23/06, 23/08, 31/04*

U.S. Cl. 428—35 9 Claims

1. A sealing gasket for the inner surface of a container closure comprising a thermoplastic composition which comprises a polymer blend consisting essentially of 60 to 95% by weight ethylene vinyl acetate copolymer having a vinyl acetate content of 5 to 19% by weight and a melt index above 420 and 5 to 40% by weight polyethylene having a melt index above 400.

4,619,849

CONTAINER SUPERIOR IN CRACK RESISTANCE

Haruyoshi Anzawa, Okayama; Kenji Satoh, Tondabayashi; Yoshinari Tanaka, Kurashiki, and Takuji Okaya, Nagaokakyo, all of Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Aug. 30, 1984, Ser. No. 646,369

Claims priority, application Japan, Sep. 8, 1983, 58-166022

Int. Cl.[4] B65D *23/00*

U.S. Cl. 428—35 5 Claims

1. A multi-layered packaging container superior in crack resistence, said container comprising an outer layer of a polyolefin resin and an inner layer of saponified ethylene-vinyl acetate copolymer characterized in that the ethylene content is 25 to 60 mole %, the degree of saponification of the vinyl acetate component is higher than 96 mole %, the melt viscosity index is lower than 1, g/10 minutes the specific gravity (d) is in the range specified by formula (1) below, and Y_1 and Y_2 are in the range specified by the formula (2) below:

$$1.274-4.4\times10^{-3}X<d<1.332-4.4\times10^{-3}X \quad (1)$$

$$|Y_1-Y_2|\leqq 1 \quad (2)$$

where d is the specific gravity of EVOH resin at 25° C., X is the ethylene content (mole %) of EVOH resin, and Y_1 and Y_2 are the melt viscosity indices of the thermoplastic resin and the saponified product of ethylene-vinyl acetate copolymer, respectively.

4,619,850

DECORATIVE WINDOW PRODUCT AND PROCESS

Thomas J. Charlton, Camano Island, Wash., assignor to Alltech Corporation, Bellevue, Wash.

Filed Jan. 11, 1985, Ser. No. 690,954

Int. Cl.[4] B44F *1/06*

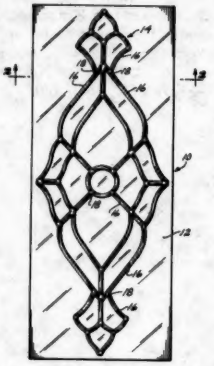
U.S. Cl. 428—38 11 Claims

1. A decorative glass window product comprising:

(a) a sheet of glass;

(b) a metal design component consisting essentially of, an integrally pre-cast, reticulated came network fabricated into a single piece of metal;

(c) said metal design component being bonded on its inner surface to one side of said sheet of glass; and



(d) a thin layer of an elastomeric adhesive bonding said metal design component to said sheet of glass.

4,619,851

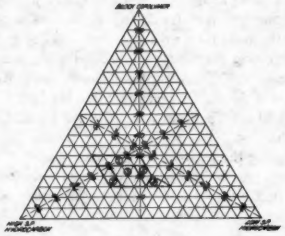
ADHESIVE COMPOSITIONS

Yukihiko Sasaki, Claremont; Kenneth S. Lin, Sepulveda, and Dianne L. Patterson, Pasadena, all of Calif., assignors to Avery International Corporation, Pasadena, Calif.

Continuation of Ser. No. 515,698, Jul. 21, 1983, abandoned. This application Jan. 4, 1985, Ser. No. 688,695

Int. Cl.[4] B32B *27/06*

U.S. Cl. 428—40 39 Claims



1. In a process for the production of matrix-stripped labels in which a label-stock laminate comprised of a face material, a pressure-sensitive-adhesive layer in contact with the release surface of a release liner die-cut by a die-cutting system which forms an array of labels by die-cutting through the face material and the pressure-sensitive adhesive to the release liner, followed by removal of a matrix of face material and pressure-sensitive adhesive leaving an array of labels on the release liner, the improvement which enables increased speed of production of matrix-stripped labels which comprises using as the pressure-sensitive adhesive in contact with the release liner a pressure-sensitive-adhesive system comprising an at least partially compatible mixture of a thermoplastic rubber, a low-softening-point aliphatic hydrocarbon tackifying resin and a high-softening-point aliphatic hydrocarbon tackifying resin forming a pressure-sensitive-adhesive system, said thermoplastic rubber present in an amount of from about 15 to about 30 percent by weight, based on the weight of the pressure-sensitive-adhesive system, said low-softening-point aliphatic hydrocarbon tackifying resin having a softening point of from about −5° to about 30° C. and present in an amount of from about 15 to about 40

percent by weight, based on the weight of the pressure-sensitive-adhesive system, said high-softening-point aliphatic hydrocarbon tackifying resin having a softening point of from about 65° to about 110° C. and present in a concentration of from about 35 to about 55 percent by weight, based on the weight of the pressure-sensitive-adhesive system.

4,619,852

PILE OF LEAD METAL SHEETS FOR SHIELDING ENVIRONMENT FROM HARMFUL SOURCE

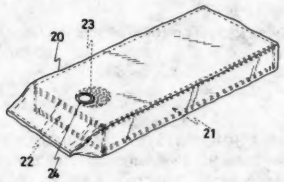
Kotaro Mio, Ikeda, and Yasuo Ijiri, Itami, both of Japan, assignors to Dainichi-Nippon Cables, Ltd., Hyogo, Japan

Filed May 22, 1984, Ser. No. 612,767

Claims priority, application Japan, May 23, 1983, 58-90362

Int. Cl.⁴ B32B *1/06, 3/06, 15/08*

U.S. Cl. 428—68 **13 Claims**



1. A light weight, flexible environmental shield for shielding an object on one side of said shield from emission from a source at the other side of said shield, said shield comprising a plurality of flexible sheets stacked one upon another, each said stacked sheet consisting essentially of a lead metal foil sheet reinforced on at least one of its sides with an organic polymer resistant to the emissions to be shielded and affixed to the surface of said lead metal foil.

2. An environmental shield as recited in claim 1, wherein the lead metal sheets are enveloped in a bag.

4,619,853

EASY-CLEAN CARPETS WHICH ARE STAIN RESISTANT AND WATER IMPERVIOUS

Randolph C. Blyth, Gulf Breeze; Pompelio A. Ucci, and George R. McLellan, both of Pensacola, all of Fla., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 546,114, Dec. 21, 1983, abandoned. This application May 30, 1985, Ser. No. 739,391

Int. Cl.⁴ B32B *3/02, 33/00*

U.S. Cl. 428—95 **4 Claims**

1. A carpet comprising a primary backing stitched with closely spaced loops or cut loops of nylon 6 or nylon 66 yarn which extend upwardly from the top surface of the primary backing to form a pile, wherein the underside of the primary backing is coated with a carpet backing adhesive composition, characterized in that said yarn is coated with a sufficient amount of a sulfonated phenol- or naphthol-formaldehyde condensation product to render the carpet stain resistant and said adhesive composition contains a fluorochemical in an amount sufficient to render said primary backing substantially impervious to water.

4,619,854

WATERPROOF, WEATHER-RESISTANT AND SUBSTANTIALLY NON-STRETCHING TEXTILE A METHOD FOR PRODUCING IT, AND A COMPONENT MADE FROM IT

Kyösti Penttinen, Helsinki, Finland, assignor to Tikkurilan Väritehtaat Oy, Finland

Filed May 24, 1985, Ser. No. 738,052

Claims priority, application Finland, Jun. 12, 1984, 842378

Int. Cl.⁴ B32B *7/00*

U.S. Cl. 428—99 **16 Claims**

1. A waterproof, weather-resistant and substantially non-stretching textile, comprising a glass-fiber cloth impregnated with at least one compound selected from polyacrylate and polyurethane, which forms a continuous coating-base for a weather-resistant synthetic coating selected from the class of compounds comprising aromatic polyimides and halogenated polyurethanes, polyacrylates and polyethylenes.

4,619,855

MAGNETIC RECORDING MEDIUM WITH ELECTRON BEAM CURED MAGNETIC LAYER

Tsutomu Okita; Nobutaka Yamaguchi, and Hiroshi Hashimoto, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Oct. 18, 1983, Ser. No. 542,931

Claims priority, application Japan, Oct. 18, 1982, 57-181485

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—143 **14 Claims**

1. A magnetic recording medium comprising a support base having an average center line roughness (Ra) of 0.035 μm or less, the support base having coated thereon a magnetic layer containing ferromagnetic fine particles and the layer further containing:

(1) a polymer selected from the group consisting of vinyl chloride-vinyl acetate-type resins and vinyl chloride-vinyl propionate-type resins having a molecular weight in the range of about 20,000 to about 100,000 and having a vinyl chloride/vinyl acetate weight ratio of 80/20 to 95/5 or a vinyl chloride/vinyl propionate weight ratio of from 80/20 to 95/5;

(2) a urethane resin; and

(3) a compound having two or more of acrylate groups or methacrylate groups in the molecule thereof, said magnetic layer being cured by radiation with electron beams, wherein the mixing ratio of the polymer (1)/the urethane resin (2) is in the range of 20 to 90 parts by weight/80 to 10 parts by weight and wherein the compound (3) is present in an amount of 50 to 400 parts by weight per 100 parts by weight of the mixtures of the polymer (1) and the urethane resin (2).

4,619,856

MAGNETIC RECORDING MEDIUM

Koh Kamada; Hiroshi Hashimoto; Tsutomu Okita, and Noburo Hibino, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 28, 1985, Ser. No. 737,968

Claims priority, application Japan, May 28, 1984, 59-106419; Sep. 18, 1984, 59-195406

Int. Cl.⁴ G11B *5/70*

U.S. Cl. 428—143 **9 Claims**

1. A magnetic recording medium comprising a nonmagnetic support, a magnetic layer, and a nonmagnetic intermediate provided between the support and the magnetic layer, wherein the nonmagnetic intermediate layer contains a radiation-polymerizable compound and finely divided spherical or flaky particles having an average primary particle size (diameter) of at least 50 Å, which particles are distributed in the intermediate layer in such a manner that the average height of the particles protruded from the surface of the intermediate layer is from about 50 to 2,000 Å, the nonmagnetic intermediate layer being

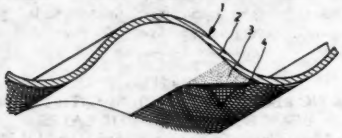
polymerized by irradiation, wherein the surface roughness of the nonmagnetic intermediate layer, Ra, is from about 0.001 to 0.02 μm.

4,619,857

THIN WALLED SHAPED BODY AND METHOD OF PRODUCING SAME

Peter Gmür, Schwerzenbach, Switzerland, assignor to Amrotex AG, Glarus, Switzerland

Filed Apr. 20, 1984, Ser. No. 602,418
Claims priority, application Switzerland, Apr. 21, 1983, 2163/83
Int. Cl.⁴ B32B *3/28*
U.S. Cl. 428—186 26 Claims



1. A thin walled asbestos fibre-free shaped article, comprising: a body of a hydraulically set material, said body having a first outside surface with areas subjectable to a highest critical tensile load; a layer of bonding material; and a reinforcing material applied directly on and bonded to said first outside surface by said bonding material at least at said highest critical tensile load areas without mutual penetration of said hydraulically set material of said body and said reinforcing material.

4,619,858

ADHESIVE PAPER MATERIAL AND A LABEL MADE FROM SUCH MATERIAL

Erik Dam, Anemonevej 12, DK-8870 Langaa, and Erik Grönning, Hedeskovvej 9, DK-8520 Lystrup, both of Denmark

PCT No. PCT/DK83/00065, § 371 Date Feb. 21, 1984, § 102(e) Date Feb. 21, 1984, PCT Pub. No. WO84/00233, PCT Pub. Date Jan. 19, 1984
PCT Filed Jun. 21, 1983, Ser. No. 590,584
Claims priority, application Denmark, Jun. 22, 1982, 2792/82
Int. Cl.⁴ B32B *27/10, 27/36*
U.S. Cl. 428—211 13 Claims

1. A web of a label sheet material comprising a printable paper laying having a layer of an adhesive at one side thereof, characterized in that the material further comprises a very thin plastic sheet interposed between the paper and the adhesive, the plastic sheet being bonded to the paper and being of a material which has a high tensile strength and a low initial extensibility, the very thin plastic sheet having a sufficiently higher tensile strength and sufficiently low initial extensibility such that the printable paper layer is reinforced and a label can be provided from said label sheet material whose tear stength is low so that the label cannot be removed from its mounting surface without rupture of the label.

2. A web according to claim 1, in which the plastic sheet has a thickness of 5–40 μm.

4,619,859

HIGHLY-ORIENTED STRETCHABLE MULTILAYER FILM AND PROCESS FOR PRODUCING THE SAME

Isao Yoshimura, Fujisawa, and Hideo Hata, Yokohama, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sep. 25, 1984, Ser. No. 654,149
Claims priority, application Japan, Oct. 7, 1983, 58-187079
Int. Cl.⁴ B32B *27/08*
U.S. Cl. 428—213 16 Claims

1. A multilayer oriented film excellent in sealability and stretchability, having high strength, high elongation and at least three layers comprising:

(1) a base layer (M layer) containing primarily a specific mixed composition selected from the group of polymer compositions consisting of (A)+(B)+(C), (A)+(B) and (B)+(C);

(A) being at least one ethylene type polymer selected from a low density polyethylene, a copolymer of ethylene with a monomer selected from the group consisting of a vinyl ester monomer, an aliphatic unsaturated mono-carboxylic acid, and an alkyl ester of said mono-carboxylic acid, and the derivatives of said copolymer;

(B) being a soft elastomer having a Vicat softening point of 60° C. or lower;

(C) being at least one polymer having a Vicat softening point of at least 100° C. selected from crystalline polypropylenes and crystalline polybutenes-1,

at least one M layer being provided adjacent to a core layer;

(2) an inside core layer (H layer) comprising primarily a polymer selected from (C); and

(3) a surface layer (S layer) containing at least one polymer selected from polymer (A), soft elastomer (B), crystalline 1,2-polybutadiene and a soft ionomer resin from an ethylenic copolymer;

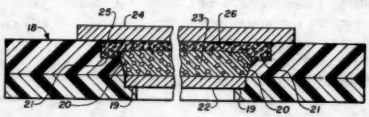
said film having a stress on 100% elongation from 100 to 600 (g/cm-width) on average in the longitudinal and traverse directions.

4,619,860

FOAMED PHOSPHATE TILE PRODUCTS

David S. Brown; John S. Forry, both of Manor Township, Lancaster County; Nancy E. Mentzer, Lancaster, and Donald J. Misselhorn, East Hempfield Township, Lancaster County, all of Pa., assignors to Armstrong World Industries, Inc., Lancaster, Pa.

Filed Jul. 1, 1985, Ser. No. 750,187
Int. Cl.⁴ B32B *3/26, 5/14, 5/20*
U.S. Cl. 428—213 6 Claims



1. A molded tile product, said product comprising laminated first and second foamed phosphate ceramic materials, said materials being derived from the reaction of at least one composition comprising calcium silicate, phosphoric acid, a metal oxide and a carbonate foaming agent, said first material comprising the decorative facing of said tile and being less dense than said second material, said tile having a decorative facing comprising a selected open-celled character, the edges and backing face of said tile comprising a substantially closed-celled character.

4,619,861

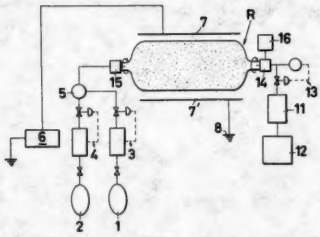
MAGNETIC POWDERS WITH IMPROVED DISPERSIBILITY

Masatoshi Nakayama; Haruyuki Morita, both of Saku, and Yuichi Kubota, Komoro, all of Japan, assignors to TDK Corporation, Tokyo, Japan

Continuation of Ser. No. 504,775, Jun. 16, 1983, abandoned. This application Jul. 19, 1985, Ser. No. 756,933
Claims priority, application Japan, Jun. 18, 1982, 57-103929; Jun. 18, 1982, 57-103930
Int. Cl.⁴ B32B *5/16*
U.S. Cl. 428—220 7 Claims

1. A magnetic powder for use in magnetic recording medi-

ums comprising individual magnetic particles of the powder, said particles being individually coated with a thin film of



nitrogen- or sulfur-containing organic polymer synthesized thereon by plasma polymerization.

4,619,862

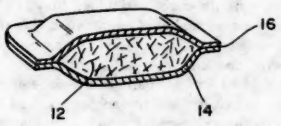
PARTICULATE PAPER PRODUCT, ESPECIALLY FOR USE AS ANIMAL LITTER

Robert C. Sokolowski, Menasha, and Russell L. Johnson, Weyauwega, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation-in-part of Ser. No. 463,100, Feb. 2, 1983, abandoned. This application Apr. 5, 1983, Ser. No. 482,366

Int. Cl.[4] B32B *23/00*

U.S. Cl. 428—221 3 Claims



1. A multiplicity of particles comprising agglomerated wood fibers having a generally irregular spherical shape and an internal layered structure, said particles being useful as an animal litter and having a bulk density from about 0.15 to about 0.25 grams per cubic centimeter.

4,619,863

SOLAR CELL ASSEMBLY

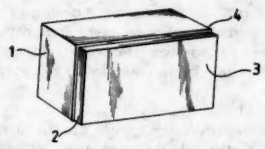
Hylton Taylor, Galltfaenan Hall, Wales, assignor to Pilkington P.E. Limited, United Kingdom

Filed Jan. 24, 1984, Ser. No. 573,487

Claims priority, application United Kingdom, Feb. 1, 1983, 8302772

Int. Cl.[4] H01L *31/00;* B05D *5/12*

U.S. Cl. 428—221 5 Claims



1. An assembly comprising a transparent cover member having a surface reference mark provided by a surface variation on an indicating major face of the cover member, and a solar cell to an adjacent surface of which the cover member is secured by an adhesive applied between said indicating major face of the cover member and the adjacent surface of the solar cell, the adhesive having a refractive index which substantially matches that of the cover member so that the applied adhesive not only secures the cover member to the solar cell but also renders the surface reference mark substantially invisible in the completed assembly, said reference mark being arranged so as to distinguish said indicating major face of the cover member from the other major face thereof and indicates the orientation in which the cover member is to be mounted on the solar cell.

4,619,864

FABRIC WITH REDUCED PERMEABILITY TO DOWN AND FIBER FILL AND METHOD OF PRODUCING SAME

James E. Hendrix, Spartanburg, S.C.; John Y. Daniels, Pineville, and Bobby D. Jackson, Marshville, both of N.C., assignors to Springs Industries, Inc., Fort Mill, S.C.

Filed Mar. 21, 1984, Ser. No. 591,843

Int. Cl.[4] B32B *5/16*

U.S. Cl. 428—240 14 Claims

1. A fabric formed of textile yarns and having a finish which significantly reduces the size of the interstices between the yarns so as to prevent the penetration of down, fiberfill or other insulating materials, and which is characterized by enhanced finish retention and reduced dusting, said fabric having a durable coating thereon forming a thin film at the surface of the fabric and bridging between intersecting yarns so as to at least partially fill the interstices between the yarns of the fabric and to durably reduce the permeability of the fabric, said coating comprising a cured reactive silicone polymer, a crosslinked durable-press finishing agent, and a starch filler dispersed in a matrix of said silicone polymer and being bound to the fabric thereby.

4,619,865

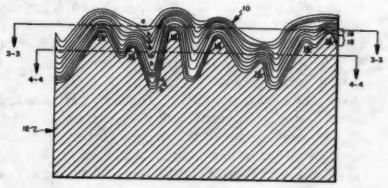
MULTILAYER COATING AND METHOD

John E. Keem, Bloomfield Hills, and James D. Flasck, Rochester, both of Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Continuation-in-part of Ser. No. 626,663, Jul. 2, 1984. This application Oct. 9, 1984, Ser. No. 658,946

Int. Cl.[4] B32B *9/04, 13/04, 9/00, 19/00*

U.S. Cl. 428—333 61 Claims



1. A wear resistant coating applied over a substrate, said coating comprising a plurality of superimposed miltilayer units, each unit comprising at least three compositionally different thin layers and each layer having a thickness sufficient to obtain its bulk coating properties, the wear properties of said coating being a combination of the individual properties of said layers, the three compositionally different layers being: (a) oxidation resistant material selected from the group consisting

of silicon, titanium, carbon, stainless steel, aluminum, stoichiometric and nonstoichiometric compositions of aluminum and oxygen, titanium and oxygen, silicon and oxygen and zirconium and oxygen; (b) nitride material selected from the group consisting of titanium nitride and hafnium nitride; and (c) disordered boron and carbon material.

4,619,866

METHOD OF MAKING A COATED CEMENTED CARBIDE BODY AND RESULTING BODY

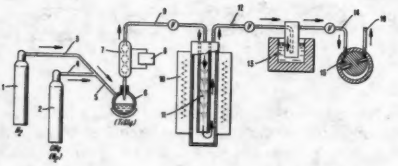
Ulf K. H. Smith, Huddinge, and Jan N. Lindström, Norsborg, both of Sweden, assignors to Santrade Limited, Lucerne, Switzerland

Continuation of Ser. No. 558,557, Dec. 5, 1983, abandoned, which is a continuation of Ser. No. 368,375, Apr. 14, 1982, abandoned, which is a continuation of Ser. No. 285,798, Jul. 22, 1981, abandoned. This application Apr. 2, 1985, Ser. No. 706,645

Claims priority, application Sweden, Jul. 28, 1980, 8005413

Int. Cl.[4] B32B *9/00, 19/00*

U.S. Cl. 428—336 **28 Claims**



8. Coated body containing at least one metal carbide or ceramic compound on which body there is applied by chemical vapor deposition at a temperature of from 700° to 1200° C. at least one thin, even, wear resistant surface layer consisting essentially of a ceramic oxide, characterized in that the ceramic oxide layer is evenly distributed on the body and at least one of the ceramic oxide layer and the surface zone of the body containing at least one member selected from the group consisting of sulfur, selenium, tellurium, phosphorus, arsenic, antimony and bismuth in an amount sufficient to achieve said even distribution.

4,619,867

AZLACTONE-CONTAINING PRESSURE-SENSITIVE ADHESIVES

Robert R. Charbonneau, Lake Elmo; Steven M. Heilmann, North St. Paul; Jerald K. Rasmussen, Stillwater, and Michael L. Tumey, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 504,213, Jun. 14, 1983, abandoned. This application Nov. 28, 1984, Ser. No. 676,206

Int. Cl.[4] C08F *220/10, 226/06;* **C09J** *7/02*

U.S. Cl. 428—355 **12 Claims**

1. A pressure-sensitive adhesive tape comprising

(a) a tape backing, and

(b) coated on at least one surface thereof a pressure-sensitive, normally-tacky, adhesive interpolymer which is the product of simultaneous polymerization of ethylenically-unsaturated monomers which comprise

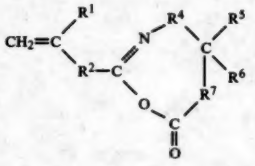
(1) from about 70 to 90 molar parts of monomers consisting of

(a) 69–100 mole percent of an acrylic acid ester of at least one non-tertiary alkyl alcohol, the molecules of said alcohol containing 1–14 carbon atoms, the average being 5–12 carbon atoms,

(b) 31–0 mole percent of at least one monomer selected from the group consisting of vinyl acetate, styrene, vinyl ethers, and alkyl methacrylates, the alkyl group having 1 to 14 carbon atoms, and

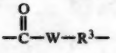
(c) 10–0 mole percent of at least one monomer selected from the group consisting of acrylamide, methacrylamide, acrylonitrile, methacrylonitrile, and N-vinyl pyrrolidone, and

(2) from 25 to 5 molar parts of at least one alkenyl azlactone monomer having the formula I



I

where R^1 is hydrogen or methyl; R^2 is selected from a single bond, $—R^3—$, or



in which R^3 is a substituted or unsubstituted alkylene group having 1 to 12 carbon atoms, and W is —O—, —S—, or —NH—; R^4 and R^7 are independently selected from a single bond, methylene, or substituted methylene having 1 to 12 carbon atoms; R^5 and R^6 are independently substituted or unsubstituted alkyl or cycloalkyl having 1 to 12 carbon atoms, aryl or aralkyl having 6 to 12 carbon atoms, or R^5 and R^6 taken together with the carbon to which they are joined forming a 5- or 6-membered carbocyclic ring or R^5 and R^6 each may be hydrogen when at least one of R^4 and R^7 is methylene; and

(3) from 25 to 5 molar parts of at least one acrylic-functional carboxylic acid monomer selected from acrylic acid, methacrylic acid, itaconic acid, maleic acid, or an N-acryloylamino acid;

said interpolymer exhibiting a glass transition temperature (Tg) of less than −15° C.

4,619,868

MAGNETIC RECORDING MEDIUM

Tsutomu Okita, Kanagawa; Kyoichi Naruo, Shizuoka, and Hiroshi Hashimoto, Kanagawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Aug. 10, 1983, Ser. No. 521,808

Claims priority, application Japan, Aug. 10, 1982, 57-138980

Int. Cl.[4] G11B *5/70*

U.S. Cl. 428—425.1 **7 Claims**

1. A magnetic recording medium comprising a support base having coated thereon a magnetic layer comprising a binder composition having a ferromagnetic powder dispersed therein, the binder composition being cured by an electron beam and comprising:

50 to 400 parts by weight of a compound having 2 or more groups selected from the groups consisting of acryloyl groups and methacryloyl groups in the molecule; and

100 parts by weight of a mixture consisting of 20 to 80 parts by weight of nitrocellulose having a thermal deformation temperature of 70° C. or more, and 20 to 80 parts by weight of a urethane resin, wherein said nitrocellulose has a modulus at 3% (stress at 3% elongation in tensile testing) of more than 3 kg/mm^2 and said urethane resin has a modulus at 10% of less than 0.5 kg/mm^2 and an elongation at break of more than 200%.

4,619,869

BIAXIALLY ORIENTED POLYESTER FILM

Tsutomu Kiriyama; Shigeru Horie; Tetsuo Ichihashi, and Masahiro Oshida, all of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Division of Ser. No. 593,237, Mar. 26, 1984, Pat. No. 4,539,384. This application Jul. 15, 1985, Ser. No. 755,142

Claims priority, application Japan, Mar. 30, 1983, 58-52517; Mar. 30, 1983, 58-52518

Int. Cl.[4] B32B *27/06, 27/37*

U.S. Cl. 428—480 1 Claim

1. A magnetic recording medium comprising

(a) a biaxially oriented film of a film-forming aromatic polyester derived from an aromatic dicarboxylic acid as a main acid component and an aliphatic glycol as a main glycol component, said film having surface properties such that

(1) it has a surface flatness, R_{CLA} defined by the following equation, of from 0.001 to 0.016 micron,

$$R_{CLA} = \frac{1}{L} \int_0^L |f(x)|\, dx$$

wherein R_{CLA} is the flatness of the film surface determined by the center line average method, f(x) is the sum of vertical distances from a straight line with a length L drawn across a film surface roughness curve measured by using a needle-contacting type surface roughness tester and being nearly parallel to the base line of said curve to maximum and minimum points of said curve respectively, and L is the length stated above for use in calculating f(x) in the surface roughness curve,

(2) it has a coefficient of travelling friction, μk, defined by the following equation, of from 0.01 to 0.20,

$$\mu k = \frac{2.303}{0.844\pi} \log \frac{T_2}{T_1}$$

wherein T_2 is the tension of the film which has been caused to travel on a fixed rod of SUS 304 stainless steel having an outside diameter of 5 mm, and T_1 is its tension before passage over the fixed rod, and

(3) the following relation is established between R_{CLA} and μk,

$$0.01 \leqq 10 \times R_{CLA} + \mu k \leqq 0.31, \text{ and}$$

(b) a magnetic layer on one or both surfaces of said film.

4,619,870

JOINING STRIP FOR PANELS

Norman J. Mitchell, 12 Bilmark Place, Brighton Le Sands, New South Wales 2216, and Alexander G. Mitchell, 29 Craigholm Street, Sylvania Heights, New South Wales 2224, both of Australia

Filed Mar. 14, 1984, Ser. No. 589,547

Claims priority, application Australia, Mar. 16, 1983, PF8473

Int. Cl.[4] F16B *13/00;* E04C *2/32*

U.S. Cl. 428—596 5 Claims

1. A single metal sheet of relatively thin dimensions defining a plane, said sheet having at least one marginal edge defining an edge strip adapted for mutual cooperation with a complimentary edge strip of an adjacent similar sheet so as to facilitate joining of said adjacent sheets, said edge strip defining a primary plane generally parallel to said plane of said sheet and having a plurality of serially adjacent alternate depressions and ridges formed outwardly from the said primary plane in a manner to facilitate nesting when placed in juxtaposed relation with said complimentary edge strip of said adjacent sheet, said adjacent sheet being generally coplanar with respect to said plane of said sheet, each adjacent pair of said alternate depressions and ridges having an opening formed therebetween defined by inclined marginal edges operative to engage in a nesting relationship corresponding inclined marginal edges on said complimentary edge strip so as to effect longitudinal

alignment of said openings in a manner to enable insertion of an elongated retainer pin through said openings.

4,619,871

COPPER FOIL FOR PRINTED CIRCUIT BOARD

Masato Takami, Kyoto, Japan, assignor to Fukuda Metal Foil & Powder Co., Ltd., Japan

Filed Nov. 15, 1984, Ser. No. 671,985

Claims priority, application Japan, Jun. 28, 1984, 59-134923

Int. Cl.[4] B32B *15/08*

U.S. Cl. 428—607 6 Claims

1. A copper foil, bonded to a resin-containing substrate to be a constituent of a printed circuit board, comprising:

on that surface which is bonded to said substrate a coating cobalt layer containing at least one element selected from the group consisting of molybdenum and tungsten for improved bonding, higher resistance to chemicals and heat, and facility for etching, wherein said element is present in an amount in the range 5 to 40 percent by weight of all the metals contained in said layer.

4,619,872

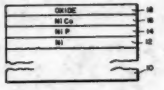
MAGNETIC PLATED MEDIA

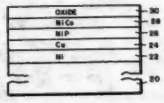
Dan Goor, Colorado Springs, Colo.; Everett Niles, San Jose, Calif., and Robert L. Stone, Monument, Colo., assignors to Digital Equipment Corporation, Maynard, Mass.

Division of Ser. No. 560,478, Dec. 12, 1983, Pat. No. 4,581,109. This application Dec. 26, 1985, Ser. No. 813,594

Int. Cl.[4] B32B *15/00*

U.S. Cl. 428—632 6 Claims





1. Magnetic plated media comprising:

an aluminum alloy substrate;

an electrolessly plated nickel layer disposed over said substrate;

a layer of nickel-phosphorous; and

a layer of nickel-cobalt over said nickel-phosphorous layer.

4,619,873
PRESERVATION DEVICE FOR LEAD STORAGE BATTERY

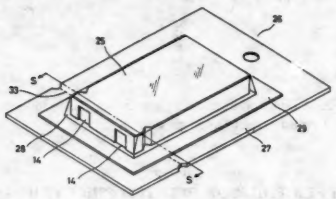
Yoshikazu Ishikura, Hirakata; Akira Watanabe, Neyagawa, and Takanao Matsumoto, Nishinomiya, all of Japan, assignors to Sanyo Electric Co., Ltd., Japan

Continuation of Ser. No. 588,542, Mar. 12, 1984, abandoned. This application Jan. 22, 1986, Ser. No. 822,671

Claims priority, application Japan, Mar. 16, 1983, 58-43920; Mar. 16, 1983, 58-37681[U]; Mar. 16, 1983, 58-37682[U]; Apr. 15, 1983, 58-56821[U]; Jul. 13, 1983, 58-128356; Aug. 4, 1983, 58-143553; Aug. 5, 1983, 58-144043; Nov. 30, 1983, 58-227349

Int. Cl.[4] H01M *2/10*

U.S. Cl. 429—48 **16 Claims**



1. A preservation device for a lead storage battery of the type including at least one negative plate, at least one positive plate, at least one separator between said negative and positive plates, an electrolyte impregnated in said negative and positive plates and said separator and held therein, and said electrolyte being limited in amount such that there is substantially no electrolyte liberated from said negative and positive plates and said separator, and external terminals having first ends respectively connected to said negative and positive plates and second ends external to said battery, said preservation device comprising:

an impedance connected between said external terminals of said lead storage battery while it is in storage after it has been fully charged;

a housing member for housing said lead storage battery during said storage; and

contact members secured to said housing member and adapted to respectively come in contact with said external terminals of said lead storage battery, and wherein;

said impedance means is secured to said housing member and connected between said contact members.

4,619,874
ELECTROCHEMICAL CELLS WITH END-OF-LIFE INDICATOR

Paul M. Skarstad, Plymouth, and Thomas G. Hayes, Minneapolis, both of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation of Ser. No. 375,447, May 6, 1982, abandoned. This application Aug. 17, 1984, Ser. No. 641,684

Int. Cl.[4] H01M *10/48*

U.S. Cl. 429—91 **20 Claims**

1. In an electrochemical cell including an oxidizable active anode material; a non-consumable, electrically conducting, inert cathode current collector material, an electrolytic solution bridging the anode and cathode current collector, the solution including a liquid, inorganic oxyhalide or thiohalide solvent and a solute for rendering the electrolytic solution conductive of anode metal ions, the improvement comprising the addition to the cell of a quantity of an EOL component, as an initial dischargeable constituent thereof, having an eletropotential lower than that of the solvent and being selected from the group consisting of arsenic trichloride, arsenic trifluoride, arsenic tribromide, the vanadium halides, the transition metal sulfides and oxides, except for the actinide series, and technetium, and mixtures thereof whereby EOL indication in the form of a step discharge is provided during discharge of the cell.

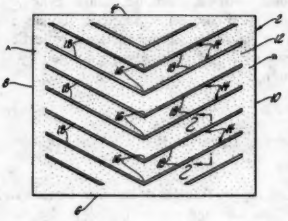
4,619,875
ANTI-STRATIFICATION BATTERY SEPARATOR

Daniel W. Stahura, Anderson, and Verl V. Smith, Jr., Muncie, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 27, 1985, Ser. No. 802,588

Int. Cl.[4] H01M *2/18*

U.S. Cl. 429—143 **2 Claims**



1. In a separator for an electric storage battery comprising a thin microporous sheet for suppressing dendrite growth between adjacent plates of the battery, said sheet having top, bottom and lateral edges defining the principal face of the separator and a plurality of ribs formed on the surface of said face the improvement comprising:

said ribs each (1) having a concave shape, (2) being superposed one over another and (3) extending laterally across said face substantially from one said lateral edge to the other said lateral edge for reducing the accumulation of highly concentrated electrolyte at the bottom of the battery during recharge.

4,619,876
FLEXIBLE DISPLAY IMAGE

Lawrence Woodward, Middle Park, Australia, assignor to Variaset Pty. Limited, Mitcham, Australia

Filed Apr. 4, 1985, Ser. No. 719,495

Claims priority, application Australia, Apr. 9, 1984, PG4480; Aug. 16, 1984, PG6613

Int. Cl.[4] G03C *1/00*

U.S. Cl. 430—11 **12 Claims**

1. A display image for display and sign applications involving bending or flexing through a substantial angle or relatively small radius curve, the display image comprising:

a flexible substrate,

an image layer on the flexible substrate, the image layer comprising an initially flexible tacky photopolymer which has been backed by a backing film, the photopolymer being of a kind that normally becomes brittle after removal of the backing film, the photopolymer having been exposed through a film positive to electromagnetic radiation so as to harden exposed portions of the photopolymer, the backing film then having been removed thereby uncovering unexposed flexible tacky photopolymer sections on the substrate, toner having been applied to the unexposed photopolymer sections so as to adhere thereto so as to thereby create an image, and

a transparent or translucent flexible sealing layer applied to the image layer while the toner coated photopolymer section remains flexible so as to sandwich the image layer between the flexible substrate and the sealing layer producing the display image which can be flexed or bent through an angle without cracking or crazing being readily discernable and showing as an adverse effect on or deterioration of the visual quality of the image.

4,619,877

LOW FIELD ELECTROPHOTOGRAPHIC PROCESS

Paul M. Borsenberger, Hilton, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 642,603, Aug. 20, 1984, abandoned. This application Dec. 5, 1985, Ser. No. 804,337

Int. Cl.[4] G03G *13/22*

U.S. Cl. 430—31 13 Claims

1. A method of electrophotographic imaging which comprises:

(1) providing a photoconductive insulating element comprising:

(a) an electrically-conductive support,

(b) a barrier layer overlying said support, and

(c) a photoconductive stratum overlying said barrier layer, said stratum comprising a layer of intrinsic α-Si(H) in electrical contact with a layer of doped α-Si(H), saie doped α-Si(H) layer being very thin in relation to the thickness of said intrinsic α-Si(H) layer,

(2) uniformly electrostatically charging said element to a surface voltage in the range of from 5 to 50 volts, and

(3) image-wise exposing said doped α-Si(H) layer to activating radiation to thereby form a latent electrostatic image on the surface of said element.

4,619,878

TETRAZONIUM SALT COMPOUND, DISAZO COMPOUND, METHOD FOR PREPARING THE SAME, AND PHOTOSENSITIVE MATERIAL CONTAINING SAID DISAZO COMPOUND FOR USE IN ELECTROPHOTOGRAPHY

Mitsuru Hashimoto, Numazu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

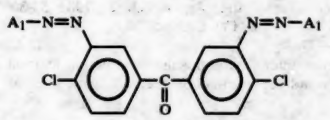
Filed Jun. 14, 1985, Ser. No. 745,331

Claims priority, application Japan, Jun. 26, 1984, 59-131250; Mar. 20, 1985, 60-56675

Int. Cl.[4] G03G *5/06*

U.S. Cl. 430—56 6 Claims

1. A photosensitive material for use in electrophotography, characterized by providing a photosensitive layer containing a disazo pigment having the following general formula (VII),



(VII)

wherein A_1 represents a coupler residue.

4,619,879

COMPOSITE TYPE PHOTOSENSITIVE MEMBER HAVING METAL-FREE PHTHALOCYANINE IN THE CHARGE GENERATING LAYER AND NONIONIC DYE BASE IN THE CHARGE TRANSPORT LAYER

Atsushi Kakuta, Hitachiohta; Hiroyuki Oka, Hitachi; Shigeo Suzuki, Hitachi; Kotaro Araya, Hitachi; Yasuki Mori, Hitachi, and Hirosada Morishita, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

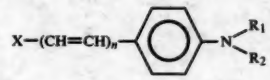
Continuation of Ser. No. 486,821, Apr. 20, 1983, abandoned. This application Jan. 28, 1985, Ser. No. 695,575

Claims priority, application Japan, Apr. 20, 1982, 57/66964

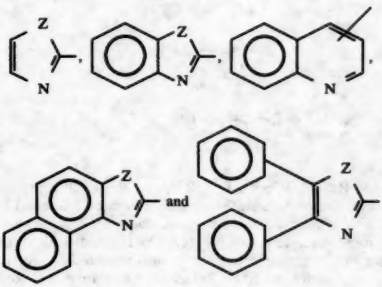
Int. Cl.[4] G03G *5/10*

U.S. Cl. 430—58 37 Claims

1. In a composite type photosensitive member for electrophotography in which a layer containing a charge generating substance and a layer containing a charge transport substance is disposed on a conductive substrate, the improvement wherein said charge generating substance contains at least one of a τ, τ', η or τ' form metal-free phthalocyanine pigment and said charge transport substance contains a nonionic dye base represented by the following general formula:



(where X is a heterocyclic group selected from



(where Z represents O or S and the heterocyclic group may be substituted), n is 0, 1 or 2 and each of R_1 and R_2 is an alkyl group of up to three carbon atoms), whereby a photosensitive member having a high sensitivity to light not only in the visible light range but also in the long wavelength range of at least 790 nm is formed.

4,619,880

ELECTROPHOTOGRAPHIC LIGHT SENSITIVE MATERIAL CONTAINS HYDRAZONE COMPOUND

Seiji Horie; Naonori Makino, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

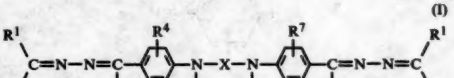
Filed Jun. 10, 1985, Ser. No. 743,323

Claims priority, application Japan, Jun. 8, 1984, 59-118416

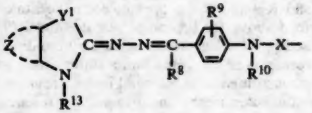
Int. Cl.[4] G03G *5/14*

U.S. Cl. 430—58 24 Claims

1. An integrated type electrophotographic light-sensitive material comprising two layers comprising (1) an electric charge generating layer containing an electric charge generating material and (2) an electric charge transporting layer containing an electric charge transporting material, provided on an electrically conductive base, wherein said electric charge generating layer contains at least one compound represented by the following general formulas (I)–(V):



(I)



(II)

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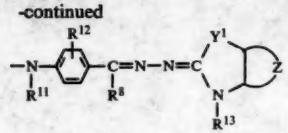
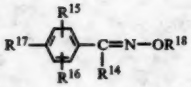
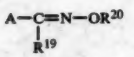


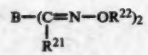
(III)



(IV)

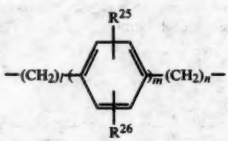


(V)

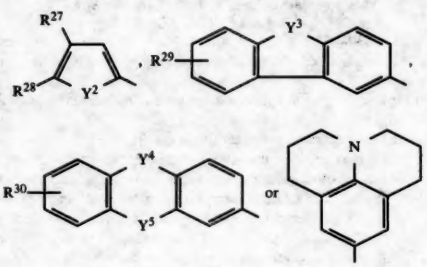


wherein R^1, R^2, R^5, R^6, R^{10}, R^{11}, and R^{13} each represent an unsubstituted or substituted straight chain or branched chain alkyl group having 1 to 12 carbon atoms, an unsubstituted or substituted straight chain or branched chain aralkyl group having 7 to 20 carbon atoms, or an unsubstituted or substituted aryl group, or R^5 and R^6 or R^{10} and R^{11} may form a N containing heterocyclic group by bonding each other, and R^5 and R^6, and R^{10} and R^{11} may be identical or different from each other, R^3, R^8, R^{14}, R^{18}, R^{19}, R^{20}, R^{21} and R^{22} and represent a hydrogen atom, an unsubstituted or substituted straight chain or branched chain alkyl group having 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having 7 to 20 carbon atoms or an unsubstituted or substituted aryl group, and R^3, R^8, R^{14}, R^{18}, R^{19}, R^{20}, R^{21} and R^{22} may be identical or different from each other, R^4, R^7, R^9, R^{12}, R^{15} and R^{16} each represent a hydrogen atom, and unsubstituted or substituted straight chain or branched chain alkyl group having 1 to 12 carbon atoms, an unsubstituted or substituted aralkyl group having 7 to 20 carbon atoms, an unsubstituted or substituted aryl group having 6 to 20 carbon atoms, a halogen atom, an alkoxy group having 1 to 20 carbon atoms or an aryloxy group having 6 to 20 carbon atoms, and R^4, R^7, R^9, R^{12}, R^{15} and R^{16} may be identical or different from each other, R^{17} represents an alkoxy group, an aralkyloxy group or a substituted amino group represented by

wherein R^{23} and R^{24} each represent the same substituent as described above for R^5 and R^6 X represents the following general formula:



wherein l and n each represnt 0 or an integer of 1 to 6, m represents 0 or 1, and R^{25} and R^{26} represent each the same substituent as described above for R^4 and R^7, or R^{25} and R^{26} may form a condensed polynuclear aromatic ring by bonding to each other, Y^1 represents an oxygen atom, a sulfur atom, a selenium atom, an unsubstituted or substituted imino group or an unsubstituted or substituted methylene group, Z represents an atomic group necessary to form a benzene or naphthalene ring, A represents a substituted or unsubstituted condensed carbocycle or a monocyclic ring or condensed 5 member heterocyclic ring or condensed 6 member heterocyclic ring represented by the following structural formula:



wherein Y^2, Y^3, Y^4 and Y^5 each represent S, O or N—R^{31} (R^{31} represents an alkyl group having 1 to 4 carbon atoms), which may be the same kind or different kinds of atom, R^{27} and R^{28} which may be identical or different each represent a hydrogen atom, an alkyl group or an alkoxy group, or R^{27} and R^{28} represent a group capable of forming a benzene ring or a naphthalene ring by linking together, and R^{29}, and R^{30} each represents a hydrogen atom, an alkyl group, an alkoxy group, an aryloxy group, and acyl group, an alkoxycarbonyl group, an aryloxycarbonyl group, a halogen atom, a monoalkylamino group, a dialkylamino group, an amido group or a nitro group, which may be substituted or unsubstituted, and B represents a substituted or unsubstituted arylene group.

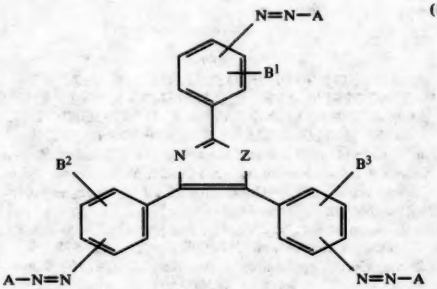
4,619,881

PHOTOCONDUCTIVE COMPOSITION AND ELECTRO-PHOTOGRAPHIC LIGHT-SENSITIVE MATERIAL CONTAINING A TRISAZO COMPOUND

Naonori Makino; Seiji Horie, and Hideo Sato, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

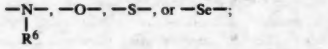
Filed Feb. 21, 1985, Ser. No. 703,968
Claims priority, application Japan, Feb. 21, 1984, 59-30918
Int. Cl.[4] G03G *5/06*
U.S. Cl. 430—77 **15 Claims**

1. A photoconductive composition containing at least one trisazo compound represented by the following general formula (I):

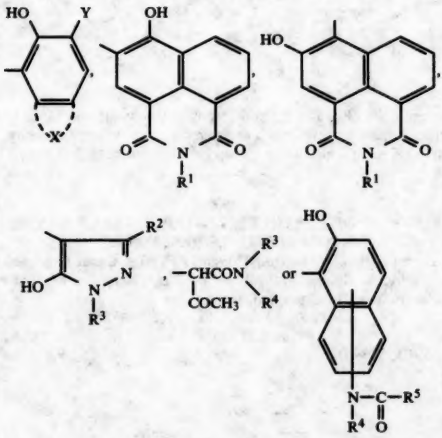


(I)

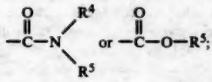
wherein Z represents



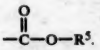
R^6 represents a hydrogen atom, a lower alkyl group, an aryl group, an aryloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, an acyl group, or a substituted group of them; As', which may be the same or different, each represents



B^1, B^2 and B^3 each represents a hydrogen atom, a halogen atom, a lower alkyl group, a lower alkoxy group or a substituted lower alkyl group or lower alkoxy group, and B^1, B^2 and B^3 may be identical or different; X represents an atomic group necessary to form an aromatic ring or heterocyclic ring, which may be substituted or unsubstituted, by condensing with the benzene ring to which the hydroxyl group and Y are bonded; Y represents



R^1 represents an alkyl group, a phenyl group or a substituted alkyl or phenyl group; R^2 represents a hydrogen atom, a lower alkyl group. a carbamoyl group, a carboxyl group, an alkoxycarbonyl group, an aryloxycarbonyl group or a substituted or unsubstituted amino group; R^3 represents an alkyl group, an aromatic group or a heteroaromatic group or a substituted alkyl group, aromatic group or heteroaromatic group; and R^4 and R^5, which may be the same or diffent, each represents a hydrogen atom, an alkyl group, an aromatic group, a heteroaromatic group or a substituted alkyl group, aromatic group or heteroaromatic group, provided that R^4 and R^5 are not both hydrogen atoms, and R^5 are not a hydrogen atom when Y is



4,619,882

PHOTOCONDUCTORS OF REDUCED PHOTOSENSITIVITY AND PROCESS FOR PRODUCING SAME

Sixdeniel Faria, Towanda, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed May 28, 1985, Ser. No. 737,998

Int. Cl.[4] G03G *5/08*

U.S. Cl. 430—95 **9 Claims**

1. A copper activated photoconductor having reduced photosensitivity and having the general formula CdX:Cu wherein X is selected from the group consisting of sulfide, selenide and mixtures thereof, said photoconductor having an iron content of from about 0.01% to about 0.05% by weight, the presence of said iron reducing the photosensitivity of said photoconductor by about 30%.

4,619,883

DYE FIXING MATERIAL

Toshiaki Aono; Koichi Nakamura, and Taku Nakamura, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

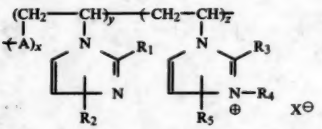
Filed Dec. 3, 1984, Ser. No. 677,408

Claims priority, application Japan, Dec. 1, 1983, 58-227493

Int. Cl.[4] G03C *5/54, 1/40*

U.S. Cl. 430—203 **20 Claims**

1. A photographic element comprising a light-sensitive material and a dye fixing material for fixing a mobile hydrophilic dye formed imagewise to a dye fixing layer, said imagewise dye being formed by heating said light-sensitive material in a state containing substantially no water after or during imagewise exposure, said light-sensitive material being composed of a support and having provided thereon, at least (1) a light-sensitive silver halide, (2) a binder, (3) a compound capable of forming the mobile hydrophilic dye imagewise by being chemically related to the reaction of reducing the silver halide to silver at high temperatures, and (4) an organic silver salt oxidizing agent; and said dye fixing materials comprising at least one layer containing as a constitutent on a support a polymer having monomeric units of formula (I)



(I)

wherein A represents a vinyl monomer unit having no imidazole or imidazolium group, R_1 and R_3 respectively represent a hydrogen atom, an alkyl group, an alkyl group substituted by a group capable of forming a coordinate bond with a metal, or a salt thereof, R_2 and R_5 respectively represent a hydrogen atom or an alkyl, aralkyl, or aryl group, R_4 represents an alkyl or aralkyl group, $X^\ominus$ represents an acid radical, x is from 10 to 80 mole%, y is from 10 to 80 mole %, z is from 0 to 10 mole % and y is not less than z.

4,619,884

PHOTOGRAPHIC PRODUCTS EMPLOYING NONDIFFUSIBLE N',N'-DIAROMATIC CARBOCYCLIC—OR DIAROMATIC HETEROCYCLIC—SULFONOHYDRAZIDE COMPOUNDS CAPABLE OF RELEASING PHOTOGRAPHICALLY USEFUL GROUPS

Stephen P. Singer, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,786

Int. Cl.[4] G03C *1/40, 5/54, 1/34, 1/42*

U.S. Cl. 430—223 **13 Claims**

1. A photographic element comprising a support having

thereon at least one photosensitive silver halide emulsion layer and also comprising, in said silver halide layer or in a layer adjacent thereto, a nondiffusible N',N'-di aromatic carbocyclic or aromatic heterocyclic sulfonohydrazide compound, or a precursor thereof, capable of releasing a diffusible photographically useful group wherein at least one of said aromatic groups comprises a nitro substituent in the 2- position or in a position conjugated thereto.

13. A photographic assemblage comprising:

(a) a photographic element according to any of claims 1 to 12;

(b) a dye image-receiving layer; and

(c) an alkaline processing composition with means for discharging same within said assemblage;

said assemblage also comprising a silver halide developing agent.

4,619,885

PHOTOPOLYMERIZABLE COMPOSITION COMPRISING A 1,3,10-TRIAZAANTHRACEN-4-ONE AS THE PHOTOINITIATOR

Rainer Wingen, Frankfurt; Ulrich Geissler, Hochheim am Main, and Hans Ruckert, Wiesbaden-Naurod, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed May 31, 1985, Ser. No. 739,512

Claims priority, application Fed. Rep. of Germany, Jun. 1, 1984, 3420425

Int. Cl.[4] G03C *1/68, 1/76*

U.S. Cl. 430—260 **14 Claims**

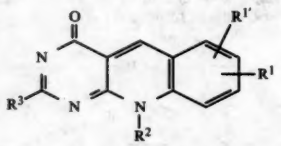
1. A photopolymerizable composition comprising:

(a) a polymeric binder;

(b) a polymerizable compound comprising at least two terminal, ethylenically unsaturated groups and having a boiling point above 100° C.; and

(c) a trinuclear N-heterocyclic photoinitiator compound,

said photoinitiator compound being represented by the formula



(I)

wherein

R^1 denotes a hydrogen atom, a halogen atom, an alkyl group, an alkoxy group or a dialkylamino group,

$R^{1'}$ denotes a hydrogen atom, a halogen atom or an alkyl group,

R^2 denotes an alkyl group or an alkoxycarbonylalkyl group, or, if R^1 and R^2 each denote an alkyl moiety,

R^1 and R^2 together form a five- or six-membered ring, and

R^3 denotes an aliphatic or a cycloaliphatic tertiary amino group.

11. A dry resist film comprising a transparent temporary support layer and a light-sensitive copying layer provided on said temporary support layer, said copying layer comprising a photopolymerizable composition as claimed in claim 1.

4,619,886

PROCESS FOR FORMING HIGH CONTRAST NEGATIVE IMAGE

Eiichi Okutsu, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 21, 1985, Ser. No. 714,418

Claims priority, application Japan, Mar. 23, 1984, 59-55685

Int. Cl.[4] G03C *1/06, 5/24*

U.S. Cl. 430—265 **8 Claims**

1. A process for forming a high contrast negative image by developing an image-wise exposed substantial surface latent image type silver halide photographic light-sensitive material in the presence of hydrazines, which comprises using a developing solution having a pH value of 10.5 to 12.3 and containing at least

(1) a developing agent which contains dihydroxylbenzenes,

(2) 0.25 mol/l or more of sulfite, and

(3) a compound represented by general formula (I):

(I)

wherein R_1, R_2, R_3, R_4 and R_5, which may be the same or different, each represents a hydrogen atom, a hydroxyl group, an alkyl group, an alkoxy group or a substituted alkyl group.

4,619,887

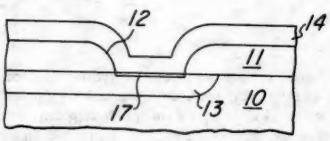
METHOD OF PLATING AN INTERCONNECT METAL ONTO A METAL IN VLSI DEVICES

Robert C. Hooper, Houston; Douglas P. Verret, Sugar Land, and Bobby A. Roane, Manvel, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 13, 1985, Ser. No. 762,886

Int. Cl.[4] G03C *5/00*

U.S. Cl. 430—313 **9 Claims**



1. A method of depositing an interconnect metal of a higher electrical conductivity than aluminum onto a predetermined area of a metal layer in an integrated circuit device, comprising:

depositing a coating of insulator over said metal layer;

patterning and etching the insulator onto a reverse image mask of a desired lead pattern;

depositing said interconnect metal onto the exposed metal layer and, selectively removing the insulator mask and underlaying metal.

4,619,888

HEAT DEVELOPABLE LIGHT-SENSITIVE MATERIAL

Ken Kawata; Yoshiharu Yabuki; Kouzou Sato, and Hiroyuki Hirai, all of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

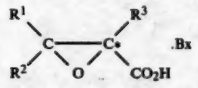
Filed Aug. 26, 1985, Ser. No. 769,297

Claims priority, application Japan, Aug. 24, 1984, 59-176397

Int. Cl.[4] G03C *1/02*

U.S. Cl. 430—353 **14 Claims**

1. A heat developable light-sensitive material comprising a support and a heat developable light-sensitive layer containing a silver halide formed thereon wherein said light-sensitive material contains as a base precursor at least one compound selected from the group consisting of compounds having the formula [I]:



[I]

wherein

R^1 and R^2 individually represent a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aryl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted heterocyclic group, or $-CO_2M$ wherein M represents a hydrogen atom, an alkali metal or H.Bx, and R^1 and R^2 can be joined together to form a ring;

R^3 represents a hydrogen atom, a substituted or unsubstituted alkyl group, a substituted or unsubstituted cycloalkyl group, a substituted or unsubstituted alkenyl group, a substituted or unsubstituted alkynyl group, a substituted or unsubstituted aralkyl group, a substituted or unsubstituted aryl group, or a substituted or unsubstituted heterocyclic group;

B represents a monoacidic organic base or diacidic organic base;

x is equal to 1 when B represents a monoacidic base and equal to $\frac{1}{2}$ when B represents a diacidic base; and

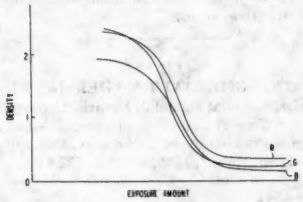
C* represents an asymmetric carbon atom to which R^3 and CO_2H may be attached in either of the possible configurations.

4,619,889

IMAGE FORMING METHOD

Hideo Yuyama, and Motohiko Tsubota, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jan. 24, 1984, Ser. No. 573,455
Claims priority, application Japan, Jan. 24, 1983, 58-10421
Int. Cl.⁴ G03C *5/24*
U.S. Cl. 430—406 **2 Claims**



1. An image forming method which comprises copying an original image on a photosensitive material employing a direct reversal photographic emulsion, comprising:

conducting ordinary exposure when the original image is a positive image and conducting exposure at high illuminance when the original is a negative image, thereby obtaining a direct positive image from either original image;

wherein the direct reversal photographic emulsion employed in the photographic material is an unfogged internal latent image type emulsion;

and wherein the exposure time at high illuminance is 1/100 sec or less.

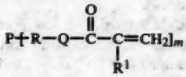
4,619,890

OPTICAL RECORDING ELEMENT HAVING A POLYMERIZED CROSSLINKED HOMOPOLYMER SMOOTHING LAYER

Michel F. Molaire, Rochester, and Mark S. Kaplan, Webster, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 19, 1985, Ser. No. 766,992
Int. Cl.⁴ G03C *1/00*
U.S. Cl. 430—495 **5 Claims**

1. An optical recording element comprising a heat-deformable optical recording layer and a support having coated thereon a smoothing layer that is a crosslinked homopolymer in which the polymerized, cross-linked recurring unit is derived from a single monomer having the structure



Q represents $-(CH_2)_nO$ or $-(CH_2CH_2O)_n$;

P represents a benzene or cyclohexane nucleus;

R represents

or —O—;

R^1 represents hydrogen or methyl;

n is 2 to 10; and

m is 2 to 4.

4,619,891

PHOTOSENSITIVE MATERIAL WITH PARTICLES OF HYDROQUINONE AND POLYMER

Osamu Takahashi, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 10, 1985, Ser. No. 732,769
Claims priority, application Japan, May 11, 1984, 59-95269
Int. Cl.⁴ G03C *1/40, 5/54*
U.S. Cl. 430—505 **8 Claims**

1. A photosensitive material comprising a support having thereon at least one silver halide emulsion layer or layers associated with a dye-providing compound capable of forming an imagewise mobile dye as the result of exposure and development, wherein a hydroquinone derivative and a water-insoluble but organic solvent-soluble homopolymer or copolymer having a recurring unit containing a

bond in a main chain or side chain are integrated and dispersed as individual particles in a hydrophilic colloid of the at least one silver halide emulsion layer or layers, wherein said hydroquinone derivatives are selected from the group consisting of a mixture of hydroquinone compounds wherein two tertiary alkyl groups having 15 carbon atoms are substituted at the 2- and 5-, or the 2- and 6-positions of the benzene ring, and an isomer mixture of secondary dodecyl hydroquinone compounds.

4,619,892

COLOR PHOTOGRAPHIC ELEMENT CONTAINING THREE SILVER HALIDE LAYERS SENSITIVE TO INFRARED

Sharon M. Simpson, Lake Elmo; John M. McQuade, and John R. Boon, both of Woodbury, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 709,561, Mar. 8, 1985, abandoned, which is a continuation-in-part of Ser. No. 674,583, Nov. 26, 1984, abandoned. This application Nov. 7, 1985, Ser. No. 795,985
Int. Cl.⁴ G03C *1/40, 1/46, 5/16*
U.S. Cl. 430—505 **37 Claims**

1. A photographic element capable of providing a full color image without exposure to radiation within the visible region of the electromagnetic spectrum comprising

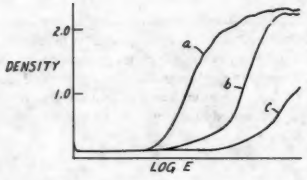
(a) a substrate, and

(b) on one side of said substrate at least three silver halide emulsion layers, each of said silver halide emulsion layers being associated with a different color photographic coupler, each of said couplers being capable of forming a different color dye upon reaction with an oxidized color photographic developer,

said three silver halide emulsion layers comprising, in order from the substrate to the surface of said photographic element, a first emulsion sensitized to a portion of the infrared region of the electromagnetic spectrum, a second emulsion sensitized to a portion of the infrared region of the electromagnetic spectrum which is of a shorter wavelength than the portion to which said first emulsion is sensitized, and a third emulsion sensitized to a portion of the infrared region of the electromagnetic spectrum which is of a shorter wavelength than the portion to which said second emulsion is sensitized, and said three silver halide emulsion layers having a construction selected from the group consisting of:

(1) each of the three layers having a contrast between 0.5 and 12 and differing from each other in photographic speed such that, at an optical density of 1.3, the speed of the third emulsion is at least 0.2 logE units faster than the second emulsion layer, and the second emulsion is at least 0.2 logE units faster than the first emulsion layer,

(2) between said first and second emulsion layers is a filter layer absorbing infrared radiation in a range overlapping the region of maximum sensitivity of said second emulsion layer without absorbing more than forty percent of the infrared radiation to which said first emulsion layer is sensitized, and between said second emulsion layer and said third emulsion layer is a filter layer absorbing radiation in a range overlapping the region of maximum sensitivity of said third emulsion layer without absorbing more than forty percent of the infrared radiation to which said second layer is sensitized, and



(3) directly between two layers comprising either said first and second emulsion layers or said second and third emulsion layers a filter layer absorbing radiation in a range overlapping the region of maximum sensitivity the one of the two layers further away from the substrate without absorbing more than forty percent of the infrared radiation to which the other of said two layers is sensitized and the other pair of emulsion layers comprising said second and third emulsion layers and said first and second emulsion layers, respectively, having a contrast between 0.5 and 12 and differing in speed from each other so that at an optical density of 1.3, the speed of the emulsion layer farthest from the substrate in said other pair of emulsion layers is at least 0.2 logE units faster than the speed of the emulsion layer closest to the substrate in said other pair of emulsion layers.

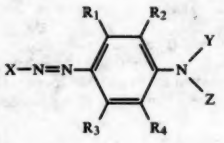
4,619,893

LIGHT-SENSITIVE MATERIAL FOR SILVER SALT DIFFUSION TRANSFER PROCESS WITH ANTIHALATION DYE

Yoshihiro Takagi, and Keiichi Adachi, both of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 11, 1985, Ser. No. 700,245
Claims priority, application Japan, Feb. 16, 1984, 59-27663
Int. Cl.[4] G03C *1/84, 5/54*
U.S. Cl. 430—519 6 Claims

1. A light-sensitive material for a silver salt diffusion transfer process comprising a silver halide emulsion layer and having an antihalation layer containing a developing agent and at least one oil-soluble dye represented by following general formula (I)



(I)

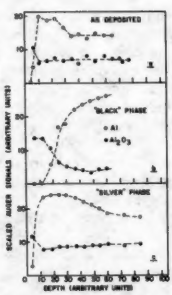
wherein X represents a benzene ring, a thiazole ring or a benzothiazole ring each having at least one electron attractive group selected from a nitro group, a cyano group, an alkylsulfonyl group, a halogen atom, and a trifluoromethyl group; R_1, R_2, R_3, R_4 each represents hydrogen, a substituted or unsubstituted alkyl group having 1 to 12 carbon atoms, a substituted or unsubstituted alkoxy group having 1 to 12 carbon atoms, a substituted or unsubstituted alkylamido group having 2 to 30 carbon atoms or a substituted or unsubstituted arylamido group having 6 to 30 carbon atoms; and Y and Z each represents hydrogen or a substituted or unsubstituted alkyl group having 1 to 10 carbon atoms.

4,619,894

SOLID-TRANSFORMATION THERMAL RESIST

Carl O. Bozler, Sudbury; Daniel J. Ehrlich, Lexington, both of Mass., and Jeffrey Y. Tsao, Albuquerque, N. Mex., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Apr. 12, 1985, Ser. No. 722,818
Int. Cl.[4] C23C *15/00*
U.S. Cl. 430—942 13 Claims



1. A process for forming a selected pattern on the surface of a substrate, comprising:

(a) forming on said substrate a substantially etchable, low ohmic resistivity cermet layer of aluminum and Al_2O_3 by depositing aluminum on said substrate in an oxygen environment;

(b) heating selected regions of said cermet layer by exposing such selected regions to radiant energy to selectively

transform said exposed regions from said substantially etchable low ohmic resistivity material to substantially less-etchable material higher ohmic resistivity; and

(c) removing the unexposed regions to form a pattern of less etchable higher ohmic resistivity material on said substrate surface.

4,619,895

LIPOPROTEIN MARKER FOR HYPERTRIGLYCERIDEMIA

Roger S. Cubicciotti, El Cerrito; Alexander E. Karu, Kensington, and Ronald M. Krauss, Berkeley, all of Calif., assignors to The Regents of The University of California, Berkeley, Calif.

Filed May 10, 1984, Ser. No. 608,750

Int. Cl.[4] G01N *33/577, 33/535;* C12N *5/00, 15/00*

U.S. Cl. 435—7 **4 Claims**

3. A method for identifying the presence of low density lipoprotein characteristic of hypertriglyceridemia in a patient, said method comprising:

contacting a sample of a biological fluid from said patient with antibodies specific for the epitopic site recognized by antibodies derived from hybridoma SPL.IVA5, A.T.C.C. Accession No. HB 8535, which antibodies bind to a low density lipoprotein subspecies having a size in the range of about 215Å to 230Å for a time and under conditions sufficient for said low density lipoprotein subspecies and said antibodies to form an immune complex and detecting the presence or absence of said immune complex, wherein the presence of said immune complex is indicative of hypertriglyceridemia.

4,619,896

PROCESS FOR OBTAINING DELTA ANTIGEN OF HEPATITIS D VIRUS AND USE OF SAID ANTIGEN AS A DIAGNOSTIC AGENT

Alan G. Shattock, Hillside, Bohernabreena, County Dublin, Ireland, and Bridget M. Morgan, 123 Plumstead High Street, Plumstead, London SE18 1SE, England

Filed Feb. 16, 1984, Ser. No. 580,660

Claims priority, application Ireland, Mar. 4, 1983, 473/83; Oct. 25, 1983, 2499/83

Int. Cl.[4] G01N *33/53, 33/544, 33/531*

U.S. Cl. 435—7 **41 Claims**

1. A process for obtaining delta antigen from an animal, known or caused to be infected with the antigen, for use as a source of delta antigen for diagnostic assays, said process comprising treating blood serum from the animal with a predetermined amount of a surfactant selected from the group consisting of condensates of ethylene oxide with fatty alcohols, condensates of ethylene oxide with aromatic alcohols, cetrimonium bromide and sodium N-lauroyl sarcosinate.

4,619,897

ENZYME IMMOBILIZATION IN A FLUORINE RESIN MEMBRANE

Masakatsu Hato; Yukio Shimura, and Keishiro Tsuda, all of Ibaraki, Japan, assignors to Agency of Industrial Science & Technology and Ministry of International Trade & Industry, both of Tokyo, Japan

Filed Oct. 11, 1983, Ser. No. 540,618

Claims priority, application Japan, Oct. 12, 1982, 57-178669

Int. Cl.[4] C12N *11/04, 11/08, 11/02, 11/00*

U.S. Cl. 435—182 **9 Claims**

1. A porous asymmetrical polytetrafluoroethylene membrane having an enzyme immobilized therein, said membrane having a thickness of 10 μm to 200 μm and an average pore diameter of 0.01 μm to 10 μm, and composed of a hydrophilic portion of a depth in the range of 30% to 80% of the thickness of the membrane, said hydrophilic portion being formed by contacting a solution of a perfluoroalkyl surface-active agent with one side of said membrane for a time sufficient for said surface-active agent to penetrate said depth of said membrane, and a hydrophobic portion which has a function of selective gas permeation forming the remainder of the membrane thickness, said pores of said hydrophilic portion containing an immobilized enzyme which provides said membrane with a function of enzymatic activity.

4,619,898

ALCOHOL OXIDASE FROM PICHIA-TYPE YEASTS

Thomas R. Hopkins, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 258,177, Apr. 27, 1981, Pat. No. 4,540,668, which is a continuation of Ser. No. 45,715, Jun. 5, 1979, abandoned. This application Jul. 9, 1985, Ser. No. 753,068

Int. Cl.[4] C12N *9/04*

U.S. Cl. 435—190 **9 Claims**

1. The alcohol oxidase from yeasts of *Pichia pastoris.*

4,619,899

METHOD AND DEVICE FOR PERFORMING MICROOPERATIONS ON CELLS

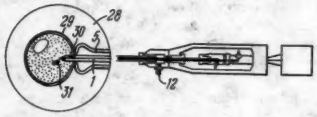
Vladimir A. Nikitin; Anatoly M. Khokhlov; Vyacheslav T. Larin, and Boris A. Fikhte, all of Puschino, U.S.S.R., assignors to Institut Biokhimii I Fiziologii Mikroorganizmov Akademii Nauk SSR, Puschino, U.S.S.R.

PCT No. PCT/SU83/00023, § 371 Date Feb. 12, 1985, § 102(e) Date Feb. 12, 1985, PCT Pub. No. WO85/00314, PCT Pub. Date Jan. 31, 1985

PCT Filed Jun. 30, 1983, Ser. No. 713,389

Int. Cl.[4] C12M *1/76*

U.S. Cl. 435—287 **6 Claims**



1. A method for performing microoperations on cells, consisting in that a cell (29) is secured by means of a micro suction cup (5) and a microinstrument (1) is used to perforate the membrane of the cell (29), characterized in that the membrane of the cell (29) is perforated in a spot under the micro suction cup (5), the instrument (1) being introduced through the recess of the micro suction cup (5).

4,619,900

SOLVENT FOR THE DETERMINATION OF WATER BY THE KARL FISCHER METHOD

Eugen Scholz, Garbsen, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 6, 1984, Ser. No. 637,912

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329020

Int. Cl.[4] G01N *33/18*

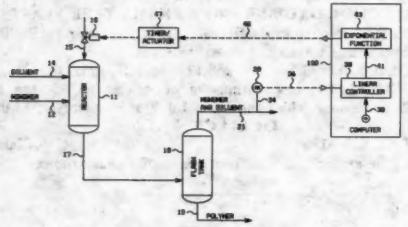
U.S. Cl. 436—42 **4 Claims**

1. A reagent for the determination of water by the Karl Fischer Method, comprising sulfur dioxide, a base and iodine or an iodide and a solvent containing (a) more than 10 percent by weight of a monohydric or dihydric alkanol having 1 to 3 carbon atoms, which alkanol is substituted on its carbon atoms with 1 to 4 halogen atoms, 1 to 4 phenyl radicals or 1 to 4 substituted phenyl radicals, the halogen atoms being attached to carbon atoms free from a hydroxyl group, and (b) less than 90 percent by weight of an organic solvent selected from the group consisting of a lower aliphatic alcohol, a liquid hydrocarbon and a liquid halogenated hydrocarbon.

4,619,901
CONTROL OF POLYMERIZATION REACTION

Don W. Webb, and William B. Bard, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 21, 1985, Ser. No. 704,104
Int. Cl.[4] B01J 8/08, 31/08
U.S. Cl. 436—55 4 Claims



1. A method for maintaining a desired unreacted monomer concentration in the reaction effluent withdrawn from a polymerization reactor, wherein monomer is provided as a feed to said polymerization reactor, wherein catalyst is provided periodically through a catalyst feeder valve to said polymerization reactor and wherein said reaction effluent contains polymer and unreacted monomer, said method comprising the steps of:

establishing a first signal representative of the actual unreacted monomer concentration in said reaction effluent;

establishing a second signal representative of the desired unreacted monomer concentration in said reaction effluent;

using a linear controller to compare said first signal and said second signal and to establish a third signal which is responsive to the difference between said first signal and said second signal, wherein said third signal is scaled so as to be representative of the number of times said catalyst feeder valve should be actuated per unit time in order to maintain the magnitude of said first signal substantially equal to the magnitude of said second signal if said catalyst has a constant activity and the same amount of said catalyst is introduced into said polymerization reaction by each actuation of said catalyst feeder valve;

establishing a fourth signal representative of the exponential of said third signal, wherein the conversion of said third signal to an exponential compensates for variations in the activity of said catalyst and variations in the amount of said catalyst introduced into said polymerization reactor each time said catalyst feeder valve is actuated; and

actuating said catalyst feeder valve in response to said fourth signal.

4,619,902
TOTAL ORGANIC CARBON ANALYZER

Bernie B. Bernard, College Station, Tex., assignor to O.I. Corporation, College Station, Tex.

Filed Jul. 27, 1984, Ser. No. 635,147
Int. Cl.[4] G01N 33/00
U.S. Cl. 436—145 3 Claims

1. A process for analyzing the carbon content of a carbon-containing sample by reacting said sample with an oxidizing agent in a wet oxidation process to generate carbon dioxide in a digestion chamber, comprising the steps of:

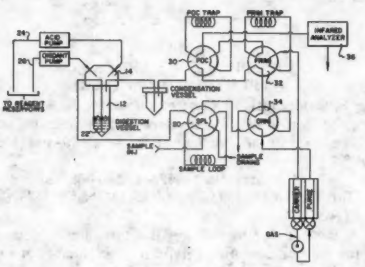
introducing said oxidizing agent within said digestion chamber;

introducing said sample within said digestion chamber;

contacting said sample with said oxidizing agent on a catalytic surface formed from a member of the platinum materials group consisting of platinum, rhodium, paladium, osmium, iridium and ruthenium;

heating said sample and said oxidizing agent contacting said catalytic surface to a temperature in a range effective to generate carbon dioxide in a liquid phase oxidation reaction;

withdrawing said carbon dioxide from said digestion chamber; and



analyzing said carbon dioxide withdrawn from said digestion chamber.

4,619,903
PROCESS FOR CARRYING OUT SEROLOGICAL INVESTIGATIONS ACCORDING TO THE PRINCIPLE OF THE COMPLEMENT FIXATION TEST, AND TEST PACKAGES FOR USE IN THIS PROCESS

Dezzö S. Bartos, Solingen, Fed. Rep. of Germany, and Denis Fitzpatrick, County Cork, Ireland, assignors to Harcourt House, Dublin, Ireland

Filed Apr. 14, 1983, Ser. No. 485,064
Claims priority, application Ireland, Apr. 21, 1982, 943/82
Int. Cl.[4] G01N 33/566, 33/563, 33/557, 53/00
U.S. Cl. 436—517 9 Claims

1. A process for carrying out serological investigations according to the complement binding reaction comprising

reacting an immunological reagent selected from the group consisting of an antigen and an antibody not specific for erythrocytes in a patient's serum with the immunological binding partner to said immunological reagent to form an immunocomplex,

providing a quantity of complement in excess of that required for reaction with said immunocomplex,

reacting said immunocomplex with said complement,

determining by a kinetic method the excess complement from the reaction of said immunocomplex and said complement after incubation with erythrocytes.

4,619,904
AGGLUTINATING IMMUNOASSAY USING PROTEIN-COATED LIQUID DROPLETS

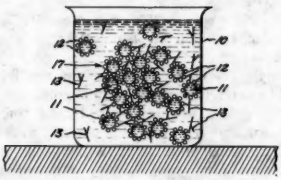
Ivar Giaever, Schenectady, and Charles R. Keese, Schoharie, both of N.Y., assignors to General Electric Company, Schenectady, N.Y. and National Foundation for Cancer Research, Inc., Bethesda, Md.

Filed Oct. 29, 1984, Ser. No. 665,867
Int. Cl.[4] G01N 33/543, 33/544; A61J 5/00; B32B 5/16
U.S. Cl. 436—518 21 Claims

1. The diagnostic method for determining the presence or absence of select protein in a liquid sample comprising the steps of:

(a) preparing an emulsion in which a first liquid is dispersed as a large number of small protein-coated liquid droplets in a second liquid, said second liquid being an aqueous medium, said first liquid being relatively immiscible with said second liquid, and the protein coating said droplets including molecules of a protein having the property of interacting specifically with said select protein;

(b) contacting the protein-coated droplets in said emulsion with a solution containing proteinaceous material and



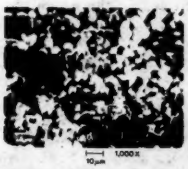
(c) determining the presence or absence of agglutination of the protein-coated droplets.

4,619,905

PROCESS FOR THE SYNTHESIS OF SILICON NITRIDE

Samuel Natansohn, and Gary Czupryna, both of Sharon, Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Dec. 24, 1984, Ser. No. 685,926
Int. Cl.[4] C04B *35/58*
U.S. Cl. 501—97 17 Claims



1. A method for making silicon nitride powder comprising the steps:

Step 1 mixing carbon and silicon dioxide having a weight ratio from about 1 to about 4 to form a homogeneous powder mixture;

Step 2 heating the powder mixture from step 1 from about 1400° C. to about 1550° C. in a nitrogen stream for a time sufficient to form silicon nitride, the nitrogen stream having a velocity from about one to about 3 cm/sec, said carbon having an oil absorption value less than 100 ml/100 g; and

Step 3 heat treating the product from step 2 in air at about 600° C. to about 700° C. for a time sufficient to completely oxidize residual carbon.

16. A method for making silicon nitride powder in accordance with claim 1 wherein said velocity of said nitrogen stream of step 2 being sufficient to form a silicon nitride powder morphology characterized by the morphology depicted in FIGS. 1 and 2.

4,619,906

CATALYTIC COMPOSITE FOR CONVERSION OF HYDROCARBONS AND THE METHOD OF PREPARATION

Susan L. Lambert, Rolling Meadows; Randy J. Lawson, Arlington Heights; Russell W. Johnson, Villa Park, and Tery L. Barr, Northbrook, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 668,102, Nov. 5, 1984. This application May 15, 1985, Ser. No. 734,308
Int. Cl.[4] B01J *29/10*
U.S. Cl. 502—66 19 Claims

1. A catalytic composite comprising a nonacidic zeolite bound within a support matrix, catalytically effective amounts of a Group VIII metal component, and sufficient surface-deposited alkali metal to provide a surface-deposited alkali metal index of at least 10.

19. A method of preparing a catalytic composite comprising compositing L-zeolite with a support matrix comprising alumina, sufficient potassium to provide a surface-deposited alkali metal index of from about 40 to about 500, and from about 0.01 to about 5.0 wt. % of platinum component based on the weight of the L-zeolite, the support matrix, the platinum component, and the surface-deposited potassium.

4,619,907

CHROMIUM PHOSPHATE CATALYST

Marvin M. Johnson, and Gerhard P. Nowack, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 578,394, Feb. 9, 1984, Pat. No. 4,543,436. This application Apr. 19, 1985, Ser. No. 725,053
Int. Cl.[4] B01J *27/188*; C01B *15/16, 25/26*
U.S. Cl. 502—210 2 Claims

1. A catalyst composition for the alkylation of aromatic hydrocarbons and the dehydration of alcohols comprising a chromium (III) phosphate represented by the formula:

$$Cr\ (PO_4)_n \cdot (OH)_m$$

where n ranges from about 0.5 to about 0.9 and m ranges from about 1.5 to about 0.3.

2. A composition according to claim 1 where said chromium (III) phosphate is additionally in combination with aluminum phosphate.

4,619,908

NON-AGED INORGANIC OXIDE-CONTAINING AEROGELS AND THEIR PREPARATION

Chung-Ping Cheng, Mt. Kisco; Paul A. Iacobucci, Tarrytown, and Edward N. Walsh, New City, all of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

Filed Dec. 24, 1984, Ser. No. 685,698
Int. Cl.[4] B01J *21/04, 21/08*
U.S. Cl. 502—214 34 Claims

1. A method of preparing inorganic oxide-containing aerogels comprising:

(a) hydrolyzing a compound comprising at least one metal dissolved in a solvent, to produce a gel;

(b) contact the hydrolyzed compound with an extraction fluid above the critical temperature and pressure of the fluid to extract the solvent and optionally,

(c) drying the gel.

4,619,909

PROCESS FOR PRODUCING MONOLITHIC CATALYST FOR PURIFYING EXHAUST GASES

Tetsuji Ono, Amagasaki; Shoichi Ichihara, Toyonaka; Tomohisa Ohta, Suita, and Sadao Terui, Ibogawa, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Filed Feb. 8, 1985, Ser. No. 699,552

Claims priority, application Japan, Feb. 10, 1984, 59-21872

Int. Cl.[4] B01J *23/10, 23/42, 23/44, 23/46*

U.S. Cl. 502—303 12 Claims

1. A process for producing a monolithic catalyst for purification of exhaust gases, which comprises depositing at least one compound of a platinum-group element selected from the group consisting of platinum, palladium and rhodium on a powder of active alumina, then fixing the platinum-group element to the active alumina by calcination or reduction, dispersing the resulting material and a powder of cerium hydroxide in water, coating the resulting aqueous slurry composition on a monolithic support, and drying the coating monolithic support.

4,619,910

CATALYST FOR SELECTIVE CONVERSION OF SYNTHESIS GAS AND METHOD OF MAKING THE CATALYST

Paul N. Dyer, Allentown, and Ronald Pierantozzi, Macungie, both of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed Jun. 5, 1985, Ser. No. 741,403

Int. Cl.[4] B01J *21/04, 21/06, 23/46, 23/74*

U.S. Cl. 502—336 18 Claims

1. Method of making a catalyst comprising the following steps:

(a) treating an inert, inorganic metal oxide catalyst base material with a nonaqueous solution of a decomposable salt or organic compound of a group IVB metal and removing remaining said nonaqueous solution;

(b) impregnating the product of Step (a) with a nonaqueous solution of a decomposable salt or organic compound of a Fischer-Tropsch metal catalyst from the group consisting of cobalt, iron or ruthenium, and removing remaining said nonaqueous solution; and

(c) exposing the product of Step (b) to a reducing atmosphere; all while maintaining said material and said products under conditions sufficient to avoid hydrolysis, oxidation, and calcination thereof.

4,619,911

SORBANT AND PROCESS USING RICE HULL ASH COMPOSITIONS

John D. Goodwin, and Forrest W. Mulkey, both of Shreveport, La., assignors to Molly Maguire, Inc., Shreveport, La.

Continuation-in-part of Ser. No. 579,465, Feb. 13, 1984, Pat. No. 4,571,389, which is a continuation-in-part of Ser. No. 460,679, Jan. 24, 1983, Pat. No. 4,488,908. This application Feb. 10, 1986, Ser. No. 828,137

Int. Cl.[4] B01J *20/04, 20/10*

U.S. Cl. 502—411 11 Claims

1. A process for sorbing liquids comprising contacting the liquid to be sorbed with a rice hull ash composition prepared by heating a mixture comprising

a. from about 45% to about 70% by weight of substantially water free rice hull ash which contains no more than about 4% carbon;

b. from about 10% to about 25% of an alkali metal hydroxide;

c. from about 2% to about 4% boric acid; and

d. from about 10% to about 25% by weight of water to a temperature of between about 70° C. and about 98° C. and maintaining the temperature in such range until the mixture becomes a solid mass, comminuting the solidified mass into discrete particles and expanding the discrete particles by rapid heating.

4,619,912

CATALYTIC CONVERTER SUBSTRATE

John I. Jalbing, Millington, and Richard T. Carriere, Davison, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sep. 3, 1985, Ser. No. 771,777

Int. Cl.[4] B01J *35/04*

U.S. Cl. 502—439 3 Claims

1. A catalytic converter substrate formed of folded foil strips prevented from telescoping by retaining means engaging opposite ends of their folds characterized by two smooth foil strips and one corrugated foil strip arranged and folded together so that alternate folds of each of the smooth foil strips have spaced sides and juxtaposed abutting sides and interleave with those of the other smooth foil strip and so that all of the folds of the corrugated foil strip have spaced sides that sandwich the folds with juxtaposed abutting sides of both the smooth foil strips so as to define passages therebetween and whereby all the strips are adapted to be retained together against telescoping by engaging the retaining means at the opposite ends of all of their folds.

4,619,913

TREATMENTS EMPLOYING DRUG-CONTAINING MATRICES FOR INTRODUCTION INTO CELLULAR LESION AREAS

Edward E. Luck, and Dennis M. Brown, both of Menlo Park, Calif., assignors to Matrix Pharmaceuticals, Inc., Menlo Park, Calif.

Continuation-in-part of Ser. No. 615,008, May 29, 1984. This application May 21, 1985, Ser. No. 736,496

Int. Cl.[4] A61K *9/00, 9/26, 9/22, 31/28*

U.S. Cl. 514—2 12 Claims

1. A proteinaceous composition comprising from 30% to 95% of collagen and/or fibrinogen dispersed in an aqueous medium as an amorphous flowable mass at a concentration of from about 5 to 75 mg/ml and from about 0.1 to 50 weight percent based on said collagen and/or fibrinogen of a cytotoxic drug.

4,619,914

GNRH ANTAGONISTS IIIB

Wylie W. Vale, Jr., and Jean E. F. Rivier, both of La Jolla, Calif., assignors to The Salk Institute for Biological Studies, San Diego, Calif.

Continuation-in-part of Ser. No. 473,876, Mar. 10, 1983, abandoned, and Ser. No. 512,920, Jul. 12, 1983, abandoned. This application Feb. 23, 1984, Ser. No. 583,093

The portion of the term of this patent subsequent to Apr. 24, 2001, has been disclaimed.

Int. Cl.[4] A61K *37/43;* C07K *7/20*

U.S. Cl. 514—15 21 Claims

1. A peptide or a pharmaceutically acceptable nontoxic salt thereof, said peptide having the formula:

X-R_1-R_2-R_3-R_4-R_5-R_6-R_7-Arg-Pro-R_{10}

wherein X is hydrogen or an acyl group having 7 or less carbon atoms; R_1 is dehydro-Pro, D-pGlu, D-Phe, D-Trp, β-D-2NAL or β-D-1NAL; R_2 is 4-Cl-D-Phe, 4-F-D-Phe, 4-NO_2-D-Phe, C^{α}Me-4Cl-D-Phe, 3,4-Cl_2-D-Phe or 4-Br-D-Phe; R_3 is D-Trp or β-D-2NAL; R_4 is Ser, Orn, AAL or aBu; R_5 is Tyr, 3-F-Phe, 2-F-Phe, 3-I-Tyr, 3-CH_3-Phe, 2-CH_3-Phe, 3-Cl-Phe or 2-Cl-Phe; R_6 is D-Trp, D-Phe, D-Leu, D-Ile, D-Nle, D-Tyr, D-Val, D-Ala, D-Ser(OtBu), β-D-2NAL, (imBzl)D-His, 4-NH_2-D-Phe, D-Lys, D-Orn, D-Har, D-His, 4-guanido-D-Phe or D-Arg; R_7 is Leu or N^{α}Me-Leu; and R_{10} is Gly-NH_2, Gly-OCH_3, Gly-OCH_2CH_3, Sar-NH_2, D-Ala-NH_2 or NH-Y, with Y being lower alkyl, fluoro lower alkyl or NH-CONH-Q, where Q is H or lower alkyl; provided however that when R_1 is β-D-NAL, R_6 is 4-NH_2-D-Phe, D-Lys, D-Orn, D-Har, D-His, 4-guanido-D-Phe or D-Arg, and provided further that when R_5 is Tyr or 2-Cl-Phe, then either (a) R_4 is Orn, AAL or aBu or (b) R_1 is β-D-2NAL and R_6 is D-His or 4-guanido-D-Phe.

4,619,915
PEPTIDE-SUBSTITUTED HETEROCYCLIC IMMUNOSTIMULANTS

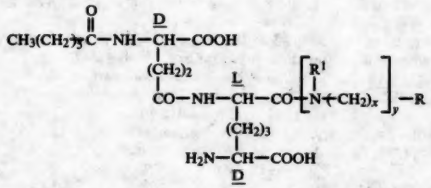
Jeffrey L. Ives, Guilford, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 19, 1984, Ser. No. 662,668

Int. Cl.[4] A61K *37/02;* **C07K** *7/02, 5/06, 5/08, 5/10*

U.S. Cl. 514—17 **18 Claims**

1. A compound having the formula



or a pharmaceutically acceptable salt thereof wherein

R is an unsubstituted or substituted 5- or 6-membered heterocyclyl moiety selected from the group consisting of imidazolidinyl, pyrrolidinyl, piperidinyl, piperazinyl, pyridinyl, morpholinyl, thienyl, imidazolyl, pyrazolyl, thiomorpholinyl, thiazolyl, thiazolinyl, furyl, tetrahydrofuryl, pyrimidinyl and isoxazolyl;

and wherein the substituent is selected from the group consisting of methyl, oxo, carboxy or carbo(C_{1-4} alkoxy);

R^1 is hydrogen or (C_{1-2})alkyl;

x is 0 or an integer from 1 to 5; and y is 0 or 1; provided that when y is 0, said heterocyclyl moiety is linked to the —CO— group at its N atom.

4,619,916
TRIPEPTIDE COMPOUNDS CONTAINING PYROGLUTAMIC ACID AND TRYPTOPHAN, PROCESS FOR THEIR PRODUCTION AND THERAPEUTIC APPLICATIONS

Giovanni Di Stazio; Vincenzo Politi; Andrea Margonelli; Giovanna De Luca, and Mario Materazzi, all of Rome, Italy, assignors to Polifarma S.p.A., Rome, Italy

Filed Dec. 7, 1984, Ser. No. 679,477

Int. Cl.[4] A61K *37/02;* **C07K** *5/08*

U.S. Cl. 514—18 **10 Claims**

1. Tripeptide compounds in a substantially pure form, formed by levorotatory amino acids of the formula

p-GLU-X-TRP

wherein X is a radical derived from an amino acid chosen from the group GLY, VAL, GLU, ASP, SER, ALA, PRO, LYS, ARG, ILE, LEU, bonded to p-GLU-TRP and by a peptide bond.

4,619,917
SUBSTITUTED 2-FURANYL- OR 5-OXO-2-FURANYL METHOXY PHOSPHORYL ALKYL CYCLIMMONIUM SALTS

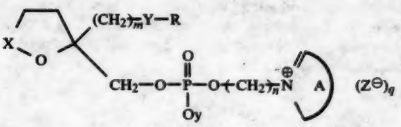
Mark L. Lee, Lake Hopatcong, and Christian Jaeggi, Randolph, both of N.J., assignors to Sandoz Pharm. Corp., E. Hanover, N.J.

Continuation-in-part of Ser. No. 756,368, Jul. 18, 1985, abandoned, which is a continuation-in-part of Ser. No. 659,249, Oct. 10, 1984, abandoned. This application Oct. 31, 1985, Ser. No. 793,367

Int. Cl.[4] A61K *31/665, 31/675;* **C07F** *9/58, 9/65*

U.S. Cl. 514—77 **24 Claims**

1. A compound of formula I:



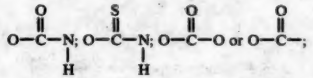
I

where

R is n-C_{12}–C_{20} alkyl, alkenyl or alkynyl; or C_{12}–C_{24} *l alkoxyalkyl;*

X is CH_2 or C=O;

Y is CH_2; O;



A, together with the nitrogen atom, forms an unsubstituted 5- or 6-membered, monocyclic ring which may optionally contain one further hetero atom selected from nitrogen and sulfur; a 5- or 6-membered, monocyclic ring which may optionally contain one further hetero atom selected from nitrogen and sulfur and which is either mono-, di- or trisubstituted by C_1–C_4 alkyl or monosubstituted by CF_3, halo, COOH or $COOCH_3$; an unsubstituted 10-membered, bicyclic ring which may optionally contain one further nitrogen atom; or a 10-membered, bicyclic ring which may optionally contain one further nitrogen atom and which is either mono-, di- or trisubstituted by C_1–C_4 alkyl or monosubstituted by CF_3, halo, COOH or $COOCH_3$;

$Z^{\ominus}$ is a pharmaceutically acceptable anion;

m is an integer 1 or 2;

n is an integer 2 to 8; and

y is $\ominus$ and q is O or y is H and q is 1.

24. A pharmaceutical composition useful in inhibiting PAF-induced blood platelet aggregation, PAF-mediated bronchoconstriction and extravasation, PAF-induced hypotension and PAF-induced ischemic bowel disease comprising a pharmaceutically acceptable carrier and a therapeutically effective amount of a compound according to claim 1.

4,619,918
TRIAZOLYL THIONOPHOSPHATES AND INSECTICIDAL AND NEMATICIDAL USE THEREOF

Fritz Maurer, Wuppertal, and Bernhard Homeyer, Leverkusen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

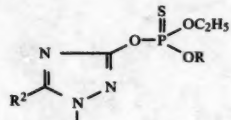
Filed Nov. 4, 1985, Ser. No. 794,815

Claims priority, application Fed. Rep. of Germany, Nov. 9, 1984, 3440913

Int. Cl.[4] A01N *57/16;* **C07F** *9/65*

U.S. Cl. 514—93 **8 Claims**

1. A triazol-3-yl thionophosphate of the formula



in which

R represents i-propyl or sec.-butyl,

R^1 represents alkyl or aryl and

R^2 represents halogen.

7. A method of combating insects or nematodes which comprises applying to such insects or nematodes or to a habitat thereof an insecticidally or nematicidally effective amount of a compound according to claim 1.

4,619,919
TREATMENT OF HYPERTENSION

Elijah H. Gold, West Orange, and Wei K. Chang, Livingston, both of N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation-in-part of Ser. No. 137,935, Apr. 7, 1980, abandoned, which is a continuation-in-part of Ser. No. 89,077, Oct. 29, 1979, abandoned, which is a continuation-in-part of Ser. No. 944,516, Sep. 20, 1978, abandoned. This application Nov. 14, 1983, Ser. No. 551,387

Int. Cl.⁴ A61K *31/615*

U.S. Cl. 514—166 **10 Claims**

1. A method of eliciting a hypotensive effect while avoiding the concomitant liability of toxic side-effects which comprises administering to a patient in need of antihypertensive therapy an amount sufficient to lower the blood pressure, but insufficient to cause said side-effects, of (−)-5-{(R)-1-hydroxy-2-[(R)-1-methyl-3-phenylpropyl)amino]ethyl}salicylamide or a pharmaceutically acceptable salt thereof, substantially free from its stereoisomers together with a pharmaceutically acceptable carrier.

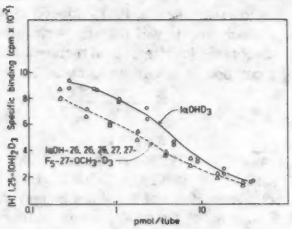
4,619,920
26,26,26,27,27-PENTAFLUORO-1α-HYDROXY-27-METHOXYVITAMIN D_3

Hector F. DeLuca, Madison, Wis.; Nobuo Ikekawa; Yoshiro Kobayashi, both of Tokyo, Japan, and Yoko Tanaka, Delmar, N.Y., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

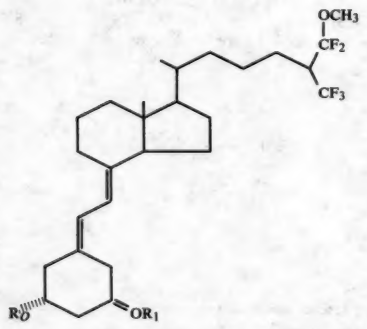
Filed Sep. 16, 1985, Ser. No. 776,342

Int. Cl.⁴ C07J *9/00*

U.S. Cl. 514—167 **8 Claims**



1. Compounds having the formula



where R and R_1 are selected from the group consisting of hydrogen and an acyl group having from 1 to about 4 carbon atoms.

3. A pharmaceutical composition comprising at least one compound of claim 1 together with at least one pharmaceutically acceptable excipient.

4,619,921
POLYHALOGENO-STEROIDS

Jaroslav Kalvoda, Binningen, and Georg Anner, Basel, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 75,939, Sep. 17, 1979, abandoned, which is a continuation-in-part of Ser. No. 836,347, Sep. 26, 1977, abandoned, which is a continuation-in-part of Ser. No. 748,337, Dec. 7, 1976, abandoned. This application Apr. 20, 1984, Ser. No. 601,746

Claims priority, application Switzerland, Dec. 12, 1975, 16151/75; Luxembourg, Sep. 29, 1976, 75903

Int. Cl.⁴ A61K *31/56*

U.S. Cl. 514—180 **2 Claims**

1. A compound which is 21-chloro-6α,9α-difluoro-11β,17α-dihydroxy-16β-methyl-pregna-1,4-diene-3,20-dione 17-propionate.

2. An anti-inflammatory pharmaceutical composition comprising an anti-inflammatory effective amount of the compound of claim 1 and a pharmaceutically acceptable carrier.

4,619,922
6α, 16α-DIMETHYL CORTICOIDS

Klaus Annen, Munster-Albachten; Henry Laurent, Berlin; Helmut Hofmeister, Berlin, and Michael Töpert, Berlin, all of Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin and Bergkamen, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,134

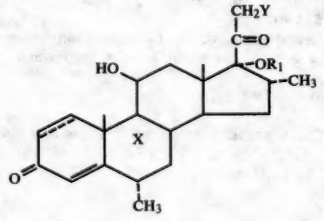
Claims priority, application Fed. Rep. of Germany, Jan. 2, 1984, 3400188

The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.

Int. Cl.⁴ C07J *5/00*

U.S. Cl. 514—180 **11 Claims**

1. A 6α,16α-Dimethyl corticoid of the formula



wherein

the bond is a single bond or a double bond and

X is a hydrogen atom, a fluorine atom, a chlorine atom, or a bromine atom,

R_1 is a formyl group, an alkanoyl group or alkoxyalkyl group of 2–8 carbon atoms, or a benzoyl group, and

Y is a chlorine atom.

10. A method for alleviating inflammation which comprises topically administering an anti-inflammatory effective amount of a compound according to claim 1 in a pharmaceutically acceptable carrier.

4,619,923

METAL PROTOPORPHYRINS IN THE CONTROL OF TRYPTOPHAN METABOLISM

Attallah Kappas, and George S. Drummond, both of New York, N.Y., assignors to The Rockefeller University, New York, N.Y.

Filed Jan. 14, 1985, Ser. No. 691,460
Int. Cl.[4] A61K *31/555*
U.S. Cl. 514—185 3 Claims

1. A method of increasing the rate of tryptophan metabolism in the liver of humans in need of such increase which comprises parenteral administration of an amount of tin protoporphyrin which is effective to increase such rate.

4,619,924

2-ALKYLTHIOPENEM DERIVATIVES

Ernest S. Hamanaka, Gales Ferry, Conn., assignor to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 610,916, May 18, 1984, abandoned, which is a continuation-in-part of Ser. No. 506,475, Jun. 21, 1983, abandoned. This application Nov. 27, 1984, Ser. No. 675,258
Int. Cl.[4] C07D *499/00*; A61K *31/425*
U.S. Cl. 514—195 24 Claims

1. A compound of the formula

or a pharmaceutically-acceptable salt thereof, wherein:

R is trans-1-oxo-3-thiolanyl, cis-1-oxo-3-thiolanyl, 1,1-dioxo-3-thiolanyl, trans-1-oxo-3-thianyl, cis-1-oxo-3-thianyl, trans-1-oxo-3-thiethanyl, 1,1-dioxo-4-thianyl, 4-thianyl, trans-1-oxo-4-thianyl, cis-1-oxo-4-thianyl, cis-1-oxo-3-thietanyl or 1-oxo-3-thiolanyl.

4,619,925

3-PROPENYL CEPHALOSPORIN DERIVATIVES

Hideaki Hoshi, Chiba, and Takayuki Naito, Kawasaki, both of Japan, assignors to Bristol-Myers Company, New York, N.Y.

Filed Nov. 8, 1985, Ser. No. 796,146
Int. Cl.[4] C07D *501/22*; A61K *31/545*
U.S. Cl. 514—200 4 Claims

1. 7β-[D-2-Amino-2-(3-hydroxyphenyl)acetamido]-3-[(Z)-1-propen-1-yl]-3-cephem-4-carboxylic acid and the pharmaceutically acceptable esters, acid addition, and metal salts thereof, said salts being antibacterially effective on oral or parenteral administration.

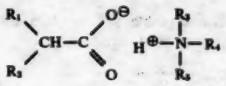
4,619,926

PHARMACEUTICAL PREPARATIONS FOR TOPICAL APPLICATION WHICH CONTAIN SALTS OF ALKANECARBOXYLIC ACIDS, NOVEL CARBOXYLIC ACID SALTS AND THE PRODUCTION THEREOF

Theodor Eckert, Münster, Fed. Rep. of Germany, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

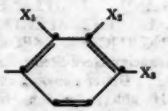
Division of Ser. No. 517,606, Jul. 27, 1983, Pat. No. 4,551,475, which is a division of Ser. No. 236,097, Feb. 20, 1981, Pat. No. 4,407,824. This application Aug. 14, 1985, Ser. No. 765,416
Int. Cl.[4] A61K *31/42, 31/55, 31/395, 31/535*
U.S. Cl. 514—210 3 Claims

1. A pharmaceutical preparation for topical application which contains an antiinflammatory and analgesically effective amount of a compound of the formula



(I)

wherein R_1 is a group of the formula



(IIa)

wherein X_1 is hydrogen, X_2 is chlorine, and X_3 is 3-pyrrolin-1-yl, and R_2 is methyl; or X_1 is 2,6-dichloroanilino, and X_2 and X_3 are hydrogen, and R_2 is hydrogen; and one of R_3, R_4, and R_5 is hydrogen, C_1–C_4 alkyl, hydroxy-C_1–C_4 alkyl, and the other two of R_3, R_4, and R_5 together form a 4 to 7 membered 3-oxaalkylene; and a pharmaceutically acceptable carrier.

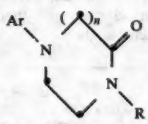
4,619,927

NOVEL NITROPYRAZINYL- AND NITROPYRIDINYL-SUBSTITUTED PIPERAZIN-3-ONE AND HEXAHYDRO-1H-1,4-DIAZEPIN-5-ONE COMPOUNDS USEFUL AS ADJUNCTS TO RADIATION THERAPY

Edward L. Engelhardt, Gwynedd Valley, and Walfred S. Saari, Lansdale, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 27, 1985, Ser. No. 716,884
Int. Cl.[4] A61K *31/55, 31/495*; C07D *401/04*
U.S. Cl. 514—218 7 Claims

1. A compound of the formula



I

wherein n is 1 or 2 and R is hydrogen or hydroxyethyl; and Ar is an aryl group selected from 3-nitro-2-pyrazinyl and 3-nitro-4-pyridyl.

2. A method for enhancing the therapeutic effect of radiation which comprises administering to a patient in need of such radiation treatment an effective amount of a compound defined in claim 1.

4,619,928

COMPOSITIONS FOR TREATING TUMORS

Homer A. Burch, and Frank F. Ebetino, both of Norwich, N.Y., assignors to Norwich Eaton Pharmaceuticals, Inc., Norwich, N.Y.

Filed Dec. 20, 1984, Ser. No. 683,850
Int. Cl.[4] A61K *31/535*
U.S. Cl. 514—236 1 Claim

1. A pharmaceutical composition, in a dosage form selected from sterile solutions, suspensions, suppositories, tablets or capsules, comprising from about 10 mg to about 2000 mg of the compound ethyl 4-hydroxy-2-((5-morpholinomethyl-2-oxo)-3-oxazolidinyliminomethyl)furo(2,3-b)pyridine-5-carboxylate, or

a pharmaceutically-acceptable salt or hydrate or mixture thereof, and a pharmaceutical carrier.

4,619,929

PHENYLPIPERAZINE DERIVATIVES OF HETARYLPHENOLS AND HETARYLANILINES, THEIR PREPARATION, AND THERAPEUTIC AGENTS CONTAINING THESE COMPOUNDS

Peter C. Thieme, Wachenheim; Gerd Steiner, Kirchheim; Wolfgang Rohr, Wachenheim; Dieter Lenke, Ludwigshafen; Josef Gries, Wachenheim; Harald Weifenbach; Hans-Juergen Teschendorf, both of Ludwigshafen; Hans P. Hofmann, Limburgerhof, and Horst Kreiskott, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 339,507, Jan. 15, 1982, abandoned. This application Mar. 19, 1984, Ser. No. 590,746

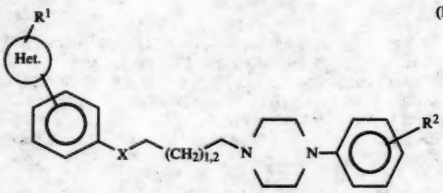
Claims priority, application Fed. Rep. of Germany, Jan. 19, 1981, 3101502

The portion of the term of this patent subsequent to Oct. 12, 1999, has been disclaimed.

Int. Cl.[4] **C07D** *413/12, 403/12, 417/12;* **A61K** *31/495*

U.S. Cl. 514—252 **10 Claims**

1. A compound of the formula I



(I)

where R^1 is hydrogen or methyl, R^2 is fluorine or methoxy, X is oxygen or an NH group, and the heterocyclic structure Het. is 1,3,4-oxadiazolyl, triazolyl or imidazolyl attached in the 2-,3- or 4-position of the phenyl ring, and their physiologically tolerated addition salts with acids.

4,619,930

ANTIPSYCHOTIC CYCLIC IMIDE DERIVATIVES OF 2-(4-BUTYLPIPERAZIN-1-YL)PYRIDINES, COMPOSITIONS AND USE

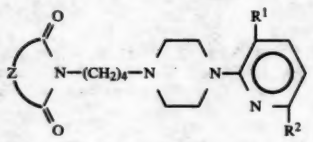
James S. New; Walter G. Lobeck, Jr., both of Evansville, and Joseph P. Yevich, Newburgh, all of Ind., assignors to Bristol-Myers Company, New York, N.Y.

Filed Jan. 16, 1985, Ser. No. 691,952

Int. Cl.[4] **A61K** *31/495;* **C07D** *417/14, 513/10*

U.S. Cl. 514—252 **9 Claims**

1. A compound of Formula I



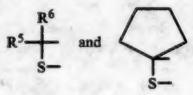
I

and the pharmaceutically acceptable acid addition salts thereof wherein

R^1 is selected from formyl and carbalkoxy

R^2 is selected from hydrogen, halogen, lower alkyl, or lower alkoxy

Z is selected from



R^5 and R^6 are independently chosen from hydrogen, lower alkyl, or phenyl.

8. The method for ameliorating an undesirable psychotic state in a mammal comprising administration to said mammal of an effective antipsychotic amount of a compound claimed in claim 1.

4,619,931

[[4-[4-(4-PHENYL-1-PIPERAZINYL)PHENOXYMETHYL]-1,3-DIOXOLAN-2-YL]METHYL]-1H-IMIDAZOLES AND 1H-1,2,4-TRIAZOLES

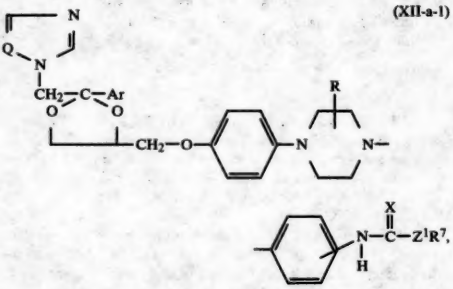
Jan Heeres, Vosselaar; Raymond A. Stokbroekx, Beerse, and Leo J. J. Backx, Arendonk, all of Belgium, assignors to Janssen Pharmaceutica, N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 470,405, Feb. 28, 1983, abandoned. This application Jan. 9, 1984, Ser. No. 569,122

Int. Cl.[4] **C07D** *403/14;* **A61K** *31/495*

U.S. Cl. 514—252 **3 Claims**

1. A chemical compound having the formula



(XII-a-1)

a pharmaceutically acceptable acid-addition salt or a stereochemically isomeric forms thereof, wherein

Q is N or CH;

Ar is phenyl or substituted phenyl, said substituted phenyl having from 1 to 3 substituents each independently selected from the group consisting of halo, lower alkyl, lower alkyloxy, nitro, amino and trifluoromethyl, provided that trinitrophenyl is excluded;

R is hydrogen or lower alkyl; and

X is O, S or NR^2 said R^2 being hydrogen or lower alkyl;

Z^1 is O or NR^8, said R^8 being hydrogen, Ar or lower alkyl optionally substituted by Ar, and

R^7 is hydrogen, Ar, amino or lower alkyl optionally substituted by a member selected from the group consisting of hydroxy, Ar-amino, lower alkylamino or carboxy or substituted with up to two lower alkyloxy radicals, provided that:

Z^1 is other than O where R^7 is hydrogen; and

where R^7 is amino, Z^1 is other than NH or O.

4,619,932

NOVEL CARBOSTYRIL DERIVATIVES, PROCESS FOR PRODUCING THEREOF AND PHARMACEUTICAL COMPOSITION CONTAINING THE SAME

Kazuo Banno; Takafumi Fujioka; Masaaki Osaki, and Kazuyuki Nakagawa, all of Tokushima, Japan, assignors to Otsuka Pharmaceutical Co., Ltd., Japan

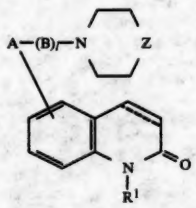
Continuation of Ser. No. 240,306, Mar. 4, 1981. This application Mar. 9, 1983, Ser. No. 473,641

Claims priority, application Japan, Mar. 6, 1980, 55-28805; Aug. 20, 1980, 55-115022

Int. Cl.[4] C07D *401/06, 215/16;* A61K *31/495, 31/47*

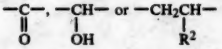
U.S. Cl. 514—253 34 Claims

1. A carbostyril derivative represented by formula (1)

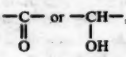


(1)

where R^1 is a hydrogen atom, a lower alkyl group, a phenyl-lower alkyl group, a lower alkenyl group or a lower alkynyl group; A is a group of the formula

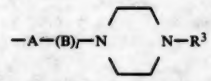


wherein R^2 is a hydrogen atom or a lower alkyl group; B is a lower alkylene group; l is 1 when A is a group of the formula

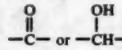


or l is 0 or 1 when A is a group of the formula

Z is a group of the formula N-R^3 wherein R^3 is an unsubstituted or a substituted-phenyl group having 1 to 3 substituents, on the phenyl ring, selected from the group consisting of a halogen atom, a lower alkyl group, a lower alkoxy group, a lower alkoxy-carbonyl group, a carboxy group, a lower alkylthio group, a lower alkanoyl group, a hydroxy group, a nitro group, an amino group and a cyano group, provided that no more than 2 of said substituents is a nitro group, or R^3 is a substituted-phenyl group having a lower alkylenedioxy group as the substituent on the phenyl ring, a phenyl-lower alkyl group or a 1,2,3,4-tetrahydronaphthyl group; and the carbon-carbon bond between the 3- and 4-positions in the carbostyril skeleton is a single or double bond, or a pharmaceutically acceptable salt thereof, provided that, when R^1 is a hydrogen atom, and the substitution position of the side-chain of the formula



wherein A is a group of the formula



B is a group of the formula

wherein R is a hydrogen atom or a lower alkyl group; l is 1; and R^3 is an unsubstituted phenyl group or a phenyl-lower alkyl group, is the 6-position in the carbostyril skeleton, then the carbon-carbon bond between the 3-and 4-positions in the carbostyril skeleton is a double bond.

4,619,933

6-ARYL PYRIMIDINES FOR TREATING APLASTIC ANEMIA

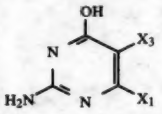
Dale A. Stringfellow, and Patricia E. Fast, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation of Ser. No. 281,820, Jul. 9, 1981, abandoned, which is a continuation of Ser. No. 136,436, Apr. 20, 1980, abandoned, which is a division of Ser. No. 79,850, Sep. 28, 1979, abandoned. This application Aug. 25, 1983, Ser. No. 526,221

Int. Cl.[4] A61K *31/505*

U.S. Cl. 514—272 4 Claims

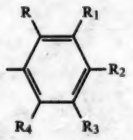
1. A process for treating aplastic anemia comprising the systemic administration of an effective amount for treating aplastic anemia of a compound of the formula:



wherein X_3 is equal to X, X_4, or X_5 wherein X_4 is fluoro, chloro, bromo or iodo, and X_5 is mono-, di- or trihalo methyl, mono-, di- or trifluoroethyl, perfluoropropyl and X is alkyl of from 1 to 3 carbon atoms, inclusive, 2-propynyl, 2-propenyl, and alkyloxyacyl where alkyl is as defined above, and X_1 is a member selected from the group consisting of:

(a) phenyl,

(b) a monosubstituted phenyl of the formula:

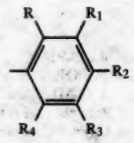


wherein provided that only one of groups R, R_1, R_2, R_3, R_4 is other than hydrogen and R or R_4 is alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive, including isomeric forms, fluoro, chloro, bromo, iodo, or nitro; R_1 or R_3 is fluoro, chloro, bromo, iodo, nitro, trifluoromethyl or alkoxy of from one to eight carbon atoms, alkoxyethyloxy wherein alkoxy is from 1 to 5 carbon atoms, inclusive, or

wherein R_5 and R_6 are the same or different and are alkyl of from 1 to 8 carbon atoms, inclusive, benzyl or taken together with —N< are a saturated cycloalkylamino group

wherein n' is 3, 4, 5 or 6 or dialkyl substituted cycloalkylamino wherein each alkyl is from 1 to 3 carbon atoms, inclusive; and R_2 is chloro, fluoro, bromo, iodo, or alkyl of from 1 to 3 carbon atoms, inclusive,

(c) a disubstituted phenyl of the formula:



wherein any two of R, R_1, R_2, R_3 and R_4 are not hydrogen and are the same or different and are fluoro, chloro, bromo, iodo, alkyl of from 1 to 8 carbon atoms, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive isomeric forms, nitro and trifluoromethyl;

(d) a trihalo substituted phenyl wherein halo is chloro, bromo, iodo or fluoro,

(e) α-naphthyl of the formula:

wherein R is substituted in either ring and is hydrogen, alkyl of from 1 to 8 carbon atoms, inclusive, including isomeric forms, alkoxy of from 1 to 8 carbon atoms, inclusive, including isomeric forms, fluoro, chloro, iodo, bromo or nitro,

(f) 2-furyl,

(g) 3-pyridyl,

(h) 2-pyridyl and

(i) 2-pyrazyl,

or a salt thereof in association with a pharmaceutical carrier to a human or animal having aplastic anemia.

4,619,934

COUGH/COLD MIXTURES COMPRISING NON-STEROIDAL ANTI-INFLAMMATORY DRUGS

Abraham Sunshine, New York; Eugene M. Laska, Larchmont, and Carole E. Siegel, Mamaroneck, all of N.Y., assignors to Analgesic Associates, Larchmont, N.Y.

Division of Ser. No. 598,502, Apr. 9, 1984, Pat. No. 4,552,899. This application Jul. 8, 1985, Ser. No. 752,546

Int. Cl.[4] A61K *31/19, 31/44, 31/435, 31/445*

U.S. Cl. 514—277 **17 Claims**

15. A method for the treatment of cough, cold, cold-like and/or flu symptoms in a mammalian organism in need of such treatment, comprising administering to such organism a symptom relieving, antihistaminically, analgesically and anti-inflammatorily effective amount of (i) at least one of the propionic acid NSAIDs, ibuprofen, naproxen, benoxaprofen, flurbiprofen, fenoprofen, fenbufen, ketoprofen, indoprofen, pirprofen, carprofen, oxaprozin, pranoprofen, miroprofen, tioxaprofen, suprofen, alminoprofen, tiaprofenic acid, fluprofen, bucloxic acid, or pharmaceutically acceptable salt thereof, in combinatory immixture with (ii) at least one antihistamine or pharmaceutically acceptable salt thereof.

4,619,935

STABLE ONCOLYTIC FORMULATIONS

Robert L. Robison, Greenwood, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 476,077, Mar. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 399,654, Jul. 19, 1982, abandoned. This application Oct. 10, 1984, Ser. No. 659,389

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—281 **8 Claims**

1. A formulation comprising a stable, sterile, ready-to-use solution suitable for i.v. injection containing about 1–2 mg./ml. of a salt of vincristine, about 10–100 mg./ml. of a polyol selected from the group consisting of mannitol, sorbitol, and sucrose, an acetate buffer in the range of about 0.02–0.0005M to maintain the pH of the solution between 3.0 and 5.0, about 1–2 mg./ml. of a preservative selected from the group consisting of methyl paraben and propyl paraben, singly or in combination, and water.

4,619,936

PHARMACEUTICAL COMPOSITIONS HAVING APPETITE REDUCING ACTIVITY AND A PROCESS FOR THEIR PREPARATION

Iván Balkányi, Tündérlaki u. 6., H-1016 Budapest; Rudolf Szebeni, Béke u. 48., H-2131 Alsogöd; Ferenc Hadi, Dózsa György u. 13., H-2626 Nagymaros; Miklós Marsó , Árpád fejedelem u. 55/a., H-1036 Budapest; Éva Kéri, Kazinczy u.7.II.5., H-1075 Budapest, and Béla Köszegi, Corvin krt. 52., H-1192 Budapest, all of Hungary

PCT No. PCT/HU84/00042, § 371 Date Apr. 19, 1985, § 102(e) Date Apr. 19, 1985, PCT Pub. No. WO85/00970, PCT Pub. Date Mar. 14, 1985

PCT Filed Aug. 24, 1984, Ser. No. 742,466

Claims priority, application Hungary, Aug. 26, 1983, 2993

Int. Cl.[4] A61K *31/44*

U.S. Cl. 514—282 **3 Claims**

1. A method for exerting an anorexigenic effect in an animal subject which comprises orally administering to said subject an anorexigenic effective amount of nalorphine or a pharmaceutically acceptable salt thereof.

4,619,937

SATURATED BICYCLIC LACTAM ACIDS AND DERIVATIVES AS COGNITION ACTIVATORS

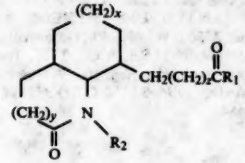
Donald E. Butler, Ann Arbor, and Yvon J. L'Italien, Plymouth, both of Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Continuation-in-part of Ser. No. 576,248, Feb. 2, 1984, abandoned. This application Jan. 7, 1985, Ser. No. 687,181

Int. Cl.[4] A61K *31/40, 31/405*; C07D *209/34, 209/52*

U.S. Cl. 514—323 **13 Claims**

1. A compound having the structural formula



where

x is zero, one, two, or three, y is zero and z is zero or one;

R_1 is selected from

—OH, or pharmaceutically acceptable metal ammonium and amine acid addition salts thereof; and

—OR_3, where R_3 is alkyl of from one to six carbon atoms, phenyl, or benzyl;

and R_2 is hydrogen.

4,619,938

FATTY ACID DERIVATIVES OF AMINOALKYL NICOTINIC ACID ESTERS AND PLATELET AGGREGATION INHIBITORS

Keiko Takahashi; Yasushi Suwabe, both of Tokyo, and Toshio Wakabayashi, Tama, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

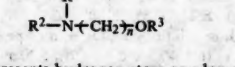
Filed Mar. 19, 1985, Ser. No. 713,496

Claims priority, application Japan, Mar. 21, 1984, 59-53796; Feb. 15, 1985, 60-26533

Int. Cl.[4] A61K *31/455;* **C07D** *213/80*

U.S. Cl. 514—356 **7 Claims**

1. Alkanolamine derivative represented by the general formula [I]



[I]

wherein R^1 represents hydrogen atom or a lower alkyl group, R^2 represents an acyl group derived from α-linolenic acid, β-linolenic acid, dihomo-β-linolenic acid, 5,8,11,14,17-eicosapentaenic acid or 7,10,13,16,19-docosapentaenic acid, R^3 represents an acyl group derived from nicotinic acid and n represents 2 or 3.

5. A platelet aggregation inhibitory pharmaceutical composition comprising an effective platelet aggregation inhibitory amount of an alkanolamine derivative according to claim 1 and a pharmaceutical carrier therefor.

4,619,939

PROCESS FOR REDUCING INTRAOCULAR PRESSURE

Thomas H. Maren, Gainesville, Fla., assignor to University of Florida, Gainesville, Fla.

Continuation of Ser. No. 442,672, Nov. 18, 1982, abandoned, which is a continuation-in-part of Ser. No. 319,093, May 29, 1981, abandoned, which is a continuation-in-part of Ser. No. 167,220, Jul. 9, 1980, abandoned. This application May 3, 1985, Ser. No. 729,907

Int. Cl.[4] A61K *31/41*

U.S. Cl. 514—363 **13 Claims**

1. A method for reducing aqueous humor formation and intraocular pressure consisting of topically applying to the cornea an amount of an aqueous solution of from about 0.1% to about 5%, by weight, of a carbonic anhydrase inhibitor and for a time sufficient to effect a reduction of aqueous humor formation and intraocular pressure, wherein said carbonic anhydrase inhibitor is a pharmaceutically acceptable sulfonamide having the following properties:

(a) sufficiently water soluble to form at least a 3 mM solution at pH 8.2 or pKa of not greater than 7.3;

(b) ether partition coefficient of at least 1.0;

(c) chloroform partition coefficient of at least 0.01;

(d) dissociation constant against carbonic anhydrase of not more than 3×10^{-8} molar;

(e) first order rate constant for penetration of said sulfonamide through a living rabbit cornea of at least 0.005 hr^{-1};

(f) not injurious to the cornea; and

(g) stable in solution and in contact with the cornea.

4,619,940

COMBATING FUNGI WITH NOVEL AZOLYL-TETRAHYDROFURAN-2-YLIDENE-METHANES

Hans-Ludwig Elbe, Wuppertal; Manfred Jautelat; Karl H. Büchel, both of Burscheid; Wilhelm Brandes, Leichlingen; Gerd Hänssler, and Paul Reinecke, both of Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

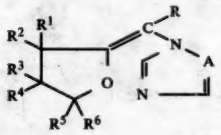
Filed Oct. 9, 1984, Ser. No. 658,941

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1983, 3336861

Int. Cl.[4] A01N *43/50, 43/653;* **C07D** *405/06*

U.S. Cl. 514—383 **13 Claims**

1. An azolyl-tetrahydrofuran-2-ylidene-methane derivative of the formula



in which

A represents a nitrogen atom or the CH group,

R represents straight-chain or branched alkyl with 1 to 12 carbon atoms, or represents straight-chain or branched alkenyl or alkinyl with in each case 2 to 12 carbon atoms, or represents straight-chain or branched alkoxyalkyl or alkylthioalkyl with in each case 1 to 6 carbon atoms in each alkyl part, or represents halogenoalkenyl, halogenoalkoxyalkyl or halogenoalkylthioalkyl with in each case 1 to 6 carbon atoms in each alkyl part and with in each case 1 to 6 identical or different halogen atoms or represents halogenoalkenyl with 2 to 6 carbon atoms and 1 to 5 identical or different halogen atoms, or represents phenylakyl, phenoxyalkyl or phenylthioalkyl with in each case 1 to 4 carbon atoms in the alkyl part and in each case optionally monosubstituted or polysubstituted in the phenyl part by identical or different substituents selected from the group consisting of halogen, alkyl, alkoxy and alkylthio with in each case 1 to 4 carbon atoms; halogenoalkyl, halogenoalkoxy and halogenoalkylthio with in each case 1 to 4 carbon atoms and 1 to 5 identical or different halogen atoms; nitro; cyano; and optionally halogen-substituted phenyl and phenoxy; or represents cycloalkyl or cycloalkylalkyl with in each case 3 to 7 carbon atoms in the cycloalkyl part and 1 to 4 carbon atoms in the alkyl part and in each case optionally monosubstituted or polysubstituted by alkyl with 1 to 4 carbon atoms;

R^1 to R^6, which can be identical or different, represent hydrogen, straight-chain or branched alkyl with 1 to 4 carbon atoms, or represent halogenoalkyl with 1 or 2 carbon atoms and 1 to 5 identical or different halogen atoms, up to a maximum of 3 substituents representing halogenoalkyl,

R^3 or R^6, which can be identical or different, also represent halogen, up to a maximum of 3 substituents having this meaning; or

R^1 and R^2, together with the carbon atom to which they are bonded, represent cycloalkyl which has 4 to 7 carbon

atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms; or

R^2 and R^3, together with the carbon atoms to which they are bonded, represent cycloalkyl which has 4 to 7 carbon atoms and is optionally substituted by alkyl with 1 or 2 carbon atoms,

or an addition product thereof with an acid or metal salt.

10. A fungicidal composition comprising a fungicidally effective amount of a compound or addition product thereof according to claim **1** in admixture with a diluent.

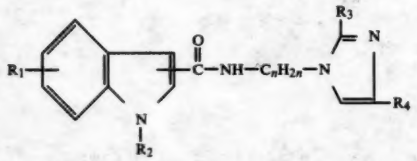
4,619,941

N-[(1H-IMIDAZOL-1-YL)ALKYL]-1H-INDOLECARBOXAMIDES USEFUL AS THROMBOXANE SYNTHETASE INHIBITORS AND ANTIHYPERTENSIVE AGENTS

William B. Wright, Jr., Woodcliff Lake, and Jeffery B. Press, Rocky Hill, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Nov. 19, 1984, Ser. No. 673,066
Int. Cl.[4] A61K *31/415;* **C07D** *403/12*
U.S. Cl. 514—397 **36 Claims**

1. A compound of the formula:



wherein R_1 is selected from the group consisting of hydrogen, halogen, alkyl(C_1–C_3) and alkoxy (C_1–C_3); R_2 is selected from the group consisting of hydrogen, alkyl (C_1–C_3) and benzyl; n is an integer from 2 to 8 inclusive; R_3 and R_4 are each individually selected from the group consisting of hydrogen, alkyl (C_1–C_3) and phenyl; or a pharmaceutically acceptable acid-addition salt thereof.

31. A method of inhibiting thromboxane synthetase enzyme in a mammal which comprises administering internally to said mammal an effective amount of a compound of the formula as recited in claim **1**.

4,619,942

INHIBITION OF RESPIRATORY SYNCYTIAL VIRUS-INDUCED CELL FUSION BY AMIDINO COMPOUNDS

Richard R. Tidwell; Edward J. Dubovi, and Joachim D. Geratz, all of Chapel Hill, N.C., assignors to University of North Carolina, Chapel Hill, N.C.

Division of Ser. No. 366,652, Apr. 8, 1982, Pat. No. 4,397,863, which is a division of Ser. No. 181,341, Aug. 26, 1980, Pat. No. 4,324,794. This application Aug. 8, 1983, Ser. No. 521,084
Int. Cl.[4] A61K *31/405, 31/415, 31/155*
U.S. Cl. 514—415 **5 Claims**

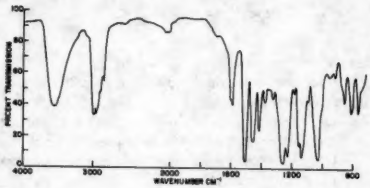
1. A method for the treatment of respiratory syncytial virus-induced cell fusion which comprises administering to a host in need of said treatment an effective amount of an aromatic amidine compound selected from the group consisting of 1-4-di(4-amidinophenoxy)-2-butanol; 5-amidino-benzimidazole; and 5-amidino-1-(4-amidinobenzyl)indole.

4,619,943

NEOLIGNANS OF *SAURURUS CERNUUS* L AND ANALOGUES THEREOF

Koppaka V. Rao, 3750 NW. 16th Pl., Gainesville, Fla. 32605

Continuation-in-part of Ser. No. 270,358, Jun. 4, 1981, abandoned. This application Sep. 10, 1984, Ser. No. 648,920
Int. Cl.[4] A61K *31/36, 31/34;* **C07D** *317/44, 307/02*
U.S. Cl. 514—464 **26 Claims**



1. The SC-neolignan

(A) SC-5 having an Rf value of 0.44 on silica gel thin-layer chromatography plates when eluted with 15% acetone in benzene; a high performance liquid chromatography retention time of 3.6 minutes on a Partisil P x S 5/25 column when eluted with 1% methanol in chloroform; infrared bands when pelleted with KBr at 3460, 2950, 1600, 1510, 1450, 1418, 1365, 1260, 1235, 1165, 1140, 1035, 948, 925, 846, 805, and 766 cm^{-1}; and, in solution in $CDCl_3$, nmr peaks (τvalues) as follows: 3.17 (m), 4.52 and 4.62 (d), 5.30 and 5.43 (d), 5.83 (m), 6.13 (s), 7.73 (m), 8.79 and 8.89 (d), and 9.23 and 9.33 (d);

(B) SC-9 having an optical rotation of $[\alpha]_D = -54.1$ at a concentration of 0.66% in $CHCl_3$; an Rf value of 0.28 on silica gel thin-layer chromatography plates when eluted with 15% acetone in benzene; infrared bands when pelleted with KBr at 3480, 2960, 2930, 1590, 1505, 1450, 1415, 1375, 1260, 1228, 1155, 1130, 1028, 850, 805, and 758 cm^{-1}; and, in solution in $CDCl_3$, nmr peaks (τvalues) as follows: 3.17 (m), 4.83 and 4.93 (d), 5.30 and 5.43 (d), 5.80 (m), 6.14 (s), 7.83 (m), 8.79 and 8.89 (d), and 9.23 and 9.33 (d);

(C) SC-6, 2α-(4-hydroxy-3-methoxy)phenyl-5β-[3-methoxy-4-{threo-3-hydroxy-3-(3,4-dimethoxyphenyl)}isopropoxyphenyl]-3α,4β-dimethyltetrahydrofuran;

(D) SC-7, 2α-[3-methoxy-4-{threo-3-hydroxy-3-(3,4-dimethoxyphenyl)}isopropoxyphenyl]-5β-[3-methoxy-4-{threo-3-hydroxy-3-(3,4-methylenedioxyphenyl}isopropoxyphenyl]-3α,4β8-dimethyltetrahydrofuran; or

(E) SC-8, 2α,5β-bis[3-methoxy-4-{threo-3-hydroxy-3-(3,4-dimethoxyphenyl)}isopropoxyphenyl]-3α,4β-dimethyltetrahydrofuran.

23. A neuroleptic composition comprising a neuroleptically effective amount of the compound SC-5, SC-7, SC-8, or SC-9 of claim **1** in admixture with a pharmaceutically acceptable carrier.

26. A method of inducing a neuroleptic response in a warm-blooded animal, which comprises administering to such animal a neuroleptically effective amount of the neuroleptic composition of claim **23**.

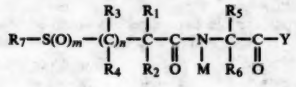
4,619,944

ANTIHYPERTENSIVE COMPOUNDS

Raymond D. Youssefyeh, Tarrytown, N.Y., and Howard Jones, Holmdel, N.J., assignors to USV Pharmaceutical Corporation, Fort Washington, Pa.

Division of Ser. No. 269,166, Jun. 1, 1981, Pat. No. 4,507,136. This application Feb. 19, 1985, Ser. No. 703,054
Int. Cl.[4] A61K *31/265, 31/275, 31/215, 31/24*
U.S. Cl. 514—513 **12 Claims**

1. Compounds of the formula



wherein

R_1, R_2, R_3, R_4, R_5, and R_6 are hydrogen, C_1–C_6 alkyl, C_2–C_6 alkenyl, C_2–C_6 alkynyl, phenyl-C_1–C_6-alkyl, or C_3–C_{16} cycloalkyl, and may be the same or different,

m is an integer from 0 to 2 inclusive,

n is an integer from 0 to 4 inclusive,

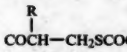
M is C_2–C_6 alkenyl, C_2–C_6 alkynyl, C_3–C_{16} cycloalkyl, C_3–C_{16} cycloalkyl-C_1–C_6 alkyl, C_3–C_{16} polycycloalkyl, C_3–C_{16} polycycloalkyl-C_1–C_6 alkyl, C_1–C_6-alkoxy-C_1–C_6-alkyl, C_1–C_6-alkylthio-C_1–C_6-alkyl, C_1–C_6-alkylamino-C_1–C_6-alkyl, di-C_1–C_6 -alkylamino-C_1–C_6-alkyl, phenyl, phen-C_1–C_6-alkyl,

Y is hydroxy, C_1–C_6 alkoxy, amino, amino-C_1–C_6-alkanoyl, phenoxy, amino-C_1–C_6-alkoxy, or hydroxy-C_1–C_6-alkoxy, and

R_7 is alkyl, phenyl, phen-C_1–C_6-alkyl, C_3–C_{16}-cycloalkyl, C_3–C_{16}-cycloalkyl-C_1–C_6-alkyl,

CH_2CO_2R, —CHM—CO_2R, —CH_2—CO—SR, —CN,

—CO—NH—CH_2CO_2R, or



wherein R is hydrogen, C_1–C_6 alkyl, or phenyl and where Y is hydroxy, their pharmaceutically acceptable, nontoxic alkali metal, alkaline earth metal, and amine salts provided that if R_7 is —CN or

then m is not zero.

9. A method of treating hypertension which comprises administering to the hypertensive animal an effective amount of a compound according to claim 1.

4,619,945

POLYENE COMPOUNDS USEFUL IN THE TREATMENT OF ALLERGIC RESPONSES

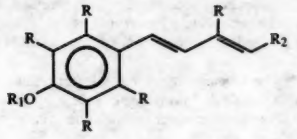
Bernard Loev, Scarsdale, and Wan-Kit Chan, Yorktown Heights, both of N.Y., assignors to USV Pharmaceutical Corp, Tuckahoe, N.Y.

Filed Oct. 9, 1985, Ser. No. 785,682

Int. Cl.⁴ A61K *31/045*

U.S. Cl. 514—729 **2 Claims**

1. A therapeutic composition for the treatment of inflammatory conditions and allergic responses in a human host, in combination with at least one pharmaceutically acceptable extender, a therapeutically effective amount of a compound of the formula



[I]

where

R is H or lower alkyl of from 1 to 5 carbon atoms;

R_1 is H, lower alkyl of from 1 to 8 carbon atoms or aralkyl; and

R_2 is $(CH_2)_nCH_2OH$; wherein n is 1 or 2.

4,619,946

LOW TEMPERATURE CATALYSTS FOR METHANOL PRODUCTION

Richard S. Sapienza, 1 Miller Ave., Shoreham, N.Y. 11786; William A. Slegeir, 7 Florence Rd., Hampton Bays, N.Y. 11946; Thomas E. O'Hare, 11 Geiger Pl., Huntington Station, N.Y. 11746, and Devinder Mahajan, 14 Locust Ct., Selden, N.Y. 11784

Division of Ser. No. 710,879, Mar. 12, 1985, which is a continuation-in-part of Ser. No. 581,935, Feb. 21, 1984, abandoned. This application Dec. 23, 1985, Ser. No. 812,705

Int. Cl.⁴ C07C *27/06, 31/04*

U.S. Cl. 518—700 **8 Claims**

1. A process for producing methanol by a low temperature reaction which comprises reacting CO with H_2 to form CH_3OH in the presence of a catalyst comprising a hydridic hydrogenating agent of the type NaH—RONa—$M(OAc)_2$ where M is selected from the group consisting of Ni, Pd and Co and R is a lower alkyl group containing from 1–6 carbon atoms in the form of a slurry.

4,619,947

CHEMICAL PROCESS

Samuel D. Jackson, Runcorn, England, assignor to Imperial Chemical Industries PLC, London, England

Filed Jul. 17, 1985, Ser. No. 756,089

Claims priority, application United Kingdom, Aug. 8, 1984, 8420149

Int. Cl.⁴ C07C *1/04, 27/06*

U.S. Cl. 518—716 **4 Claims**

1. A method for the preparation of hydrocarbons and oxygenated hydrocarbons which comprises contacting a gaseous mixture of carbon monoxide, hydrogen and oxygen with a catalyst comprising a metal of Group VII or Group VIII of the Periodic Table, the amount of oxygen not exceeding 10% by volume based on the volume of hydrogen.

4,619,948

COMPOSITE ACTIVE FILTER MATERIAL

T. Scott Kennedy, East Boothbay, and Paul F. Herman, Boothbay Harbor, both of Me., assignors to Twin Rivers Engineering, East Boothbay, Me.

Filed Jan. 7, 1985, Ser. No. 689,249

Int. Cl.⁴ C08G *18/14;* A24B *15/28;* B29C *67/00*

U.S. Cl. 521—52 **45 Claims**

1. An improved active filter material comprising:

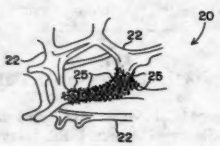
an open hydrophilic foam substrate and bonded active surface particle powder composite generated by foam polymerization of a prepolymer phase with an aqueous phase, said foam substrate comprising open foam characterized by relatively low pressure drop and low resistance to flow through the foam substrate;

said aqueous phase comprising a pourable and flowable slurry mixture of an aqueous liquid carrier, active surface particle powder, and surfactant wetting agent means, said aqueous phase comprising approximately 15% to 50% by

weight of the active surface particle powder and comprising sufficient aqueous liquid carrier for a pourable aqueous phase and for providing a protective liquid layer or coating over the active surfaces of the active surface powder particles;

said prepolymer phase comprising a hydrophilic polyurethane NCO-terminated prepolymer receptive to the aqueous phase for foam polymerization upon mixing with the aqueous phase;

said aqueous phase and prepolymer phase being mixed together in ratio by weight of aqueous phase to prepolymer



phase in the range of approximately 1/1 to 8/1 so that the mixture is initially pourable and flowable for molding;

said active filter material comprising an open hydrophilic foam substrate with active surface powder particles distributed over and bonded to the surfaces of the hydrophilic foam substrate, the major portion of active surfaces of the powder particles being substantially protected by the layer of liquid carrier from obstruction and deactivation during the foam polymerization and being exposed for active filter functioning.

2. The active filter material of claim 1 wherein the active surface particle powder comprises activated charcoal powder.

4,619,949

ABRASION RESISTANT COATINGS

John F. Kistner, Oakdale, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 641,723, Aug. 17, 1984, Pat. No. 4,587,169. This application Jan. 7, 1986, Ser. No. 816,807

Int. Cl.[4] C08G *77/00*

U.S. Cl. 522—170 **10 Claims**

1. An abrasion-resistant, water-repellent film on a substrate, said film comprising the reaction product of a composition comprising:

(1) more than 60% by weight of an epoxy-terminated silane,

(2) 5 to 20% by weight of an aliphatic monoepoxide having between 8 and 20 carbon atoms in the aliphatic group, and

(3) less than 10% by weight of a material copolymerizable with epoxy groups, other than the aliphatic monoepoxide wherein said film is adhered to the surface of a developed photographic image on a color print paper.

4,619,950

METHOD AND MATERIAL FOR PLUGGING AN INGOT MOLD

Walter H. Carlson, Aurora, Ohio, assignor to Graphite Sales, Inc., Chagrin Falls, Ohio

Continuation of Ser. No. 694,589, Jan. 24, 1985, abandoned, which is a continuation of Ser. No. 587,219, Mar. 17, 1984, abandoned. This application Feb. 25, 1986, Ser. No. 833,573

Int. Cl.[4] C21B *7/12*

U.S. Cl. 523—140 **16 Claims**

1. A particulate composition curable in situ in an ingot mold plug opening comprising, based on total weight of the composition, from 70% to 90% of a plug aggregate and from about 10% to 30% of a water free thermosetting resinous binder consisting of a furan resin and a phenolic resin in substantially equal amounts and having substantially different temperature at which polymerization of the corresponding resin commences, the moisture content of the composition being less than about 2%.

15. A particulate hydrophobic composition curable in situ in an ingot plug opening comprising, based on total weight of the composition, from about 70% to 90% of a carbon and silica based aggregate, less than about 1% moisture and from about 10% to 30% of a non-hygroscopic phenolic-based thermosetting resinous binder comprising at least about 50% of a phenolic resin which is unmodified and an additive material for changing the curing temperature of said phenolic resin in said composition and also effective to lower the freezing point of said composition.

4,619,951

SEALING COMPOSITIONS FOR ELECTRIC CABLES

Klaus Gorke, Dorsten, and Josef Schoppen, Haltern, both of Fed. Rep. of Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Fed. Rep. of Germany

Filed Sep. 20, 1985, Ser. No. 778,440

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1984, 3438780

Int. Cl.[4] C08L *9/00*; C08K *3/26*; C09D *5/25*; H01B *3/18*

U.S. Cl. 523—173 **9 Claims**

1. A sealing composition for electric wires comprising:

a binder component; and

an inorganic, water-insoluble, powdered filler material;

wherein:

a. the binder component is a combination of two binders—binder I (in an amount of 70–97 wt. %), and binder II (in an amount of 3–30 wt. %);

a.1 binder I is a homopolymer of 1,3-butadiene or a copolymer based on 1,3-butadiene (in an amount of $\geqq$80 wt. %) and at least one other copolymerizable 1,3-diene or 1,3-cyclodiene or at least one other copolymerizable alpha-olefin (in an amount of $\leqq$20 wt. %) (with the indicated composition of the said copolymer determined by IR analysis); the average relative molecular weight (referred to hydrogen), $\overline{M}n$, of the homopolymer or copolymer is 500 to 5,000, and its viscosity (at 20° C. according to DIN 53 015) is 2–80 dPa-sec;

a.2 binder II is a polymer based on 1,3-butadiene with laterally extending succinic anhydride groups (i.e., a maleinized polymer based on 1,3-butadiene) with an acid number of 15 to 150 (mg KOH/g); this polymer being prepared by adding maleic anhydride to a polymer of the type of binder I (feature a.1); and

b. the filler material is comprised of at least 80 wt. % of an alkaline earth carbonate which has not been provided with a hydrophobic coating and which is capable of reacting with the anhydride groups of binder II; said filler being present in an amount of 65–80 wt. % of the total sealing composition.

4,619,952

RESINOUS BLENDS OF EPOXY AND ACRYLIC RESINS AND THE USE THEREOF IN ELECTRODEPOSITION

Terence J. Hart, Allison Park; Rostyslaw Dowbenko, Gibsonia; Rudolf Maska; Ellor J. Van Buskirk, both of Pittsburgh, and Marvin T. Tetenbaum, Wexford, all of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 637,251, Aug. 2, 1984. This application Sep. 20, 1985, Ser. No. 778,000

Int. Cl.[4] C08K *3/20*; C08L *63/00*

U.S. Cl. 523—409 **24 Claims**

1. A coating composition comprising as an essential film-former a resinous blend of:

(i) from about 5 to 95 percent by weight of an amine-defunctionalized epoxy resin which is at least partially amidated with a polycarboxylic acid, an acid anhydride thereof or a functional equivalent thereof; and

(ii) from about 5 to 95 percent by weight of an acid group-

containing resin having an acid value of 20 to 350, said resin is different from the resin of (i) above;
the percent by weight is based on total resin solids.

4,619,953

LOW STYRENE EMISSION VINYL ESTER RESIN EMPLOYING POLYACRYLATES FOR FIBER-REINFORCED APPLICATIONS

John A. Schols, and Kee C. Yu, both of Sarnia, Canada, assignors to The Dow Chemical Company, Midland, Mich.

Filed Sep. 9, 1985, Ser. No. 773,499
Int. Cl.[4] C08K 5/00
U.S. Cl. 523—465 12 Claims

1. An improved, low styrene emission, VER composition containing: (1) a VER which is an esterification product of a polyepoxide and a monounsaturated monocarboxylic acid; (2) styrene as a reactive diluent; (3) a wax as a styrene emission inhibitor; and (4) wherein the improvement comprises including in such composition a polyacrylate wherein said polyacrylate is present in an amount sufficient to increase the adhesion characteristic of the VER composition with a reinforcing material used therewith.

4,619,954

FIBERGLASS REINFORCED PLASTIC SHEET MATERIAL WITH FIRE RETARDANT FILLER

Sidney O. Warner, II, Bolivar, Tenn., assignor to Sequentia, Incorporated, Strongsville, Ohio

Filed Jun. 22, 1984, Ser. No. 623,405
Int. Cl.[4] C08K 7/16, 9/06; C08L 67/00, 67/06
U.S. Cl. 523—516 20 Claims

1. A fiberglass reinforced rigid panel with fire retardant property, said panel being comprised of fiberglass reinforcement embedded in a resinous composition having a constituency comprising, in parts by weight basis 100 total weight parts of said resinous composition:

unsaturated polyester resin	42.5–56.5 parts
halogenated polyester resin	14.5–18.5 parts
monomer cross-linking agent	12.0–22.0 parts
inorganic fire retardant filler	15.0–25.0 parts

and with there being further combined with said resinous composition up to about 3 weight parts of a catalyst combination, together with from about 20 to about 30 weight parts of reinforcing fiberglass, both added to 100 weight parts of said resinous composition, said unsaturated polyester resin being prepared using glycols comprising primarily propylene glycol and glycols of higher molecular weight and said halogenated polyester resin contributing at least about 3.3 weight percent of halogen to said resinous composition.

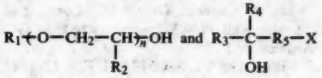
4,619,955

ISOCYANATE FUNCTIONAL URETHANES AS FLEXIBILIZING ADDITIVES IN COATING VEHICLES

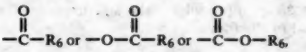
Thomas W. Druetzler, Lynwood, Ill., assignor to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 686,943, Dec. 27, 1984, Pat. No. 4,560,494.
This application Sep. 9, 1985, Ser. No. 774,117
Int. Cl.[4] C08L 5/04, 75/00; C08F 283/04
U.S. Cl. 524—29 14 Claims

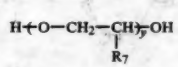
1. A coating composition comprising:
(i) 30–99 parts by weight of a thermoplastic or thermosetting film-forming polymer vehicle; and
(ii) 1–70 parts by weight of an isocyanate functional urethane which comprises the reaction product of:
(a) an aliphatic polyisocyanate having an average of at least 2.1 isocyanate groups per molecule and selected from the group consisting of the biurets and isocyanurates of linear aliphatic diisocyanates; and
(b) at least one monofunctional alcohol having a molecular weight less than about 500 and which is selected from the group consisting of:



wherein
n is from 1 to about 10; R_1 is an aliphatic radical of 1 to about 12 carbons; R_2 is H or CH_3; R_3 and R_4 are independently aliphatic of 1 to about 12 carbons or H; R_5 is an aliphatic radical of 1 to about 8 carbons or nothing; X is



where R_6 is an aliphatic radical of 1 to about 12 carbons; and
(c) at least one diol having the formula:



wherein R_7 is H or CH_3 and y is from 1 to about 40; wherein the total NCO/OH equivalents ratio is greater than 1.0 and the ratio of OH equivalents from (b) to OH equivalents from (c) ranges from 0.3:1 to 2.0:1.0.

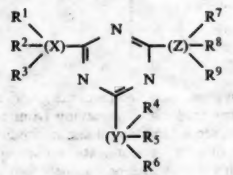
4,619,956

STABILIZATION OF HIGH SOLIDS COATINGS WITH SYNERGISTIC COMBINATIONS

Peter V. Susi, Middlesex, N.J., assignor to American Cyanamid Co., Stamford, Conn.

Filed May 3, 1985, Ser. No. 730,146
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—87 19 Claims

1. A method of stabilizing a polymer film, coating or molded article against the action of light, moisture, and oxygen comprising incorporating in said polymer a stabilizingly and synergistically effective amount of:
(A) A 2,2,6,6-tetraalkylpiperidine compound, or the acid addition salts or complexes with metal compounds thereof; and
(B) A tris-aryl-s-triazine compound represented by the formula:



(I)

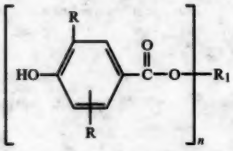
wherein X, Y and Z are each aromatic, carbocylic radicals of less than three 6-membered rings, and at least one of X, Y and Z is substituted by a hydroxy group ortho to the point of attachment to the triazine ring; and each of R^1 through R^9 is selected from the group consisting of hydrogen, hydroxy, alkyl, alkoxy, sulfonic, carboxy, halo, haloalkyl and acylamino.

4,619,957
BENZOATE-STABILIZED RIGID POLYVINYL CHLORIDE COMPOSITIONS

William J. Reid, Perth, Australia; Jean M. Zappia, Yonkers, N.Y.; Gerald A. Capocci, Greenwich, Conn., and John D. Spivack, Spring Valley, N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 579,232, Feb. 13, 1984, Pat. No. 4,555,541. This application Aug. 9, 1985, Ser. No. 764,282
The portion of the term of this patent subsequent to Nov. 26, 2002, has been disclaimed.
Int. Cl.[4] C08K 5/58
U.S. Cl. 524—91 10 Claims

1. A rigid polyvinyl chloride composition comprising, in addition to said polyvinyl chloride, 2 to 8% titanium dioxide, by weight of the polyvinyl chloride, an effective thermal stabilizing amount of a tin mercaptide and an effective amount for the purpose of ultraviolet light stabilization of a benzoate compound of the formula



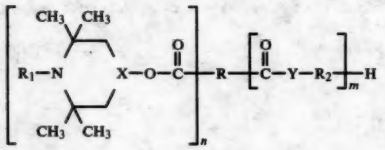
wherein
R is alkyl;
R_1 is alkylenetriyl, alkylenetetrayl, alkylenepentayl and alkylenehexayl; and
n is 3–6.

4,619,958
MIXED 2,2,6,6-TETRAMETHYL PIPERIDINYL CARBOXYLIC ACID ESTER AND AMIDE LIGHT STABILIZERS AND STABILIZED SYNTHETIC POLYMERS

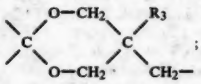
Tohru Haruna, Okegawa, and Atsushi Nishimura, Saitama, both of Japan, assignors to Adeka Argus Chemical Co., Ltd., Urawa, Japan

Filed Sep. 30, 1983, Ser. No. 537,479
Claims priority, application Japan, Oct. 2, 1982, 57-173589
Int. Cl.[4] C08K 5/34
U.S. Cl. 524—102 24 Claims

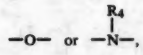
1. Mixed light stabilizers for synthetic polymers having the formula:



wherein:
R is a polyvalent group selected from the group consisting of aliphatic hydrocarbon groups having from one to about twenty carbon atoms, cycloaliphatic hydrocarbon groups having from three to about sixteen carbon atoms and aromatic hydrocarbon groups having from six to about thirty carbon atoms; such groups substituted with from one to about six groups selected from the group consisting of hydroxy, acyloxy, and halogen; and $N(C_{n_1}H_{2n_1})_3$ where n_1 is a number from one to five;
R_1 is selected from the group consisting of hydrogen, oxyl, alkyl, epoxy alkyl and hydroxy alkyl having from one to about twelve carbon atoms, alkyl aryl having from six to about eighteen carbon atoms, and acyl having from two to about twelve carbon atoms;
R_2 is selected from the group consisting of alkyl and alkenyl having from eight to about thirty carbon atoms;
R_3 is lower alkyl having from one to about six carbon atoms;
X is >CH— or



Y is



where R_4 is hydrogen or R_2;
m is a number from 0 to 6; and
n is a number from 3 to 6;
the mixture comprising from about 10 to about 60% by weight of compounds wherein m is 0, and from about 90 to about 40% by weight of compounds wherein m is from 1 to 6.

4,619,959
CONTINUOUS PRODUCTION PROCESS OF STYRENE-BASE RESIN

Tetsuyuki Matsubara; Norifumi Ito; Kazuo Sugazaki; Kouzo Ichikawa; Mune Iwamoto, and Toshihiko Ando, all of Yokohama, Japan, assignors to Mitsui Toatsu Chemicals, Incorporated and Toyo Engineering Corporation, both of Tokyo, Japan

Filed May 24, 1985, Ser. No. 737,531
Claims priority, application Japan, May 28, 1984, 59-106555; Jun. 8, 1984, 59-116501
Int. Cl.[4] C08F 12/08, 291/02, 2/44; C08K 5/20
U.S. Cl. 524—228 10 Claims

1. In a process for producing a styrene-base resin by continuous bulk polymerization or solution polymerization, the improvement wherein, in the course of the process, one or more higher fatty acid amides represented by the following formula (I):

$$R_1CONHR_2 \quad (I)$$

wherein R_1 is an alkyl group having 8 to 22 carbon atoms, R_2 is hydrogen, a hydroxymethyl group or $—(CH_2)_nNHCOR^3$, wherein R^3 is an alkyl group having 8 to 22 carbon atoms and can be same as or different from R_1, and n is 1 or 2, are continuously added in a dissolved or molten state to a continuous flow of the styrene-base resin in a molten or dissolved state so that a styrene-base resin having excellent moldability and a good hue is produced.

4,619,960
STABLE BLENDS OF VINYL CHLORIDE AND ACRYLIC LATEXES

James S. Dodge, Bay Village, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Jun. 1, 1983, Ser. No. 500,119
Int. Cl.[4] C08J 5/29
U.S. Cl. 524—245 12 Claims

1. In a latex blend comprising at least one vinyl halide latex and at least one acrylic latex, which latexes are normally colloidally incompatible when mixed, the improvement comprising an admixed surfactant or a mixture thereof containing a nitrogen atom having attached thereto repeating alkylenoxy groups in sufficient amount to prevent large viscosity increase of said blend and thereby improve colloidal compatibility of said latexes, said blend containing said surfactant having acidic

pH, said vinyl halide latex contains at least 5% by weight of polymerized vinyl halide or vinylidene halide and selected from homopolymers thereof and copolymers thereof with one or more other copolymerizable monomers, said acrylic latex is a polymer of 50 to 95% by weight of polymerized C_1 to C_{18} alkyl acrylate and/or methacrylate and one or more other copolymerizable monomers, said latex blend has pH of less than about 6, said surfactant is selected from cationic-nonionic surfactants, and said blend also contains 0.5 to 10 weight parts per 100 weight parts of said vinyl halide and said acrylic latexes of a cosurfactant selected from nonionic surfactants which are devoid of nitrogen.

4,619,961

HALOGENATED POLYPHENYL SULFIDE OR SULFIDE/ETHER COMPOUNDS

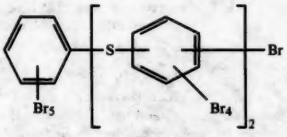
Burton J. Sutker, Edison; Saadat Hussain, East Brunswick, and Amgad S. Mossaad, S. River, all of N.J., assignors to Ethyl Corporation, Richmond, Va.

Filed Dec. 26, 1984, Ser. No. 686,486

Int. Cl.[4] C08K *5/36*; C07C *149/34*

U.S. Cl. 524—393 **4 Claims**

1. A composition comprising a high impact rubber-modified polystyrene containing a fire retardant amount of a perbrominated polyphenylene sulfide having the structure:



4,619,962

THERMOPLASTIC POLYMER COMPOSITIONS

Kyosaku Sato, Sarnia, Canada, assignor to Polysar Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 549,501, Nov. 7, 1983, abandoned. This application Apr. 12, 1985, Ser. No. 722,358

The portion of the term of this patent subsequent to Apr. 2, 2002, has been disclaimed.

Int. Cl.[4] C08K *3/22, 3/16*; C08L *13/00, 77/06*

U.S. Cl. 524—401 **23 Claims**

1. A thermoplastic composition comprising, per 100 parts by weight of polymeric materials, as one polymeric material from about 30 to about 80 parts by weight of crystalline polyamide and as second polymeric material from about 20 to about 70 parts by weight of synthetic rubbery polymer which polymer comprises, for a total of 100 parts by weight, from about 25 to about 40 parts by weight of acrylonitrile or methacrylonitrile, from about 0.5 to about 10 parts by weight of one or more α,β-unsaturated carboxylic acid and the balance butadiene, and as non-polymeric additives from about 0.1 to about 15 parts by weight per 100 parts by weight of polyamide of an additive selected from the halides of lithium, magnesium, calcium and zinc, and from about 1 to about 10 parts by weight per 100 parts by weight of polymeric materials of an additive selected from the oxides and hydroxides of magnesium, calcium, barium and zinc and the peroxides of calcium and zinc.

2. The composition of claim 1 which comprises as polymeric materials from about 35 to about 70 parts by weight of crystalline polyamide and from about 30 to about 65 parts by weight of synthetic rubbery polymer.

7. The composition of claim 2 wherein the halide additive is selected from the chlorides and bromides of lithium, magnesium, calcium and zinc.

4,619,963

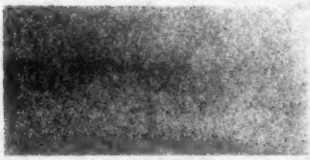
RADIATION SHIELDING COMPOSITE SHEET MATERIAL

Hisataka Shoji, and Shigehiro Ouchi, both of Otsu, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 469,283, Feb. 24, 1983, Pat. No. 4,485,838. This application Jul. 2, 1984, Ser. No. 626,782

Int. Cl.[4] C08K *3/00*; D02G *3/00*

U.S. Cl. 524—439 **7 Claims**



1. A radiation shielding composite sheet comprising lead fibers of more than 99% purity having 0.5 to 1.3 mm mean length and of a diameter of less than 60 microns and a synthetic resin, said fibers containing 50 to 500 ppm tin wherein said radiation shielding composite sheet has a specific gravity greater than 4.0.

4,619,964

STABILIZED AQUEOUS COPOLYMER DISPERSIONS

Andrew J. Kielbania, Chalfont, and Samuel S. Kim, Huntingdon Valley, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 3, 1983, Ser. No. 538,459

Int. Cl.[4] C08F *2/22, 267/00*

U.S. Cl. 524—460 **15 Claims**

1. An aqueous latex of a water insoluble vinyl addition polymer prepared by emulsion polymerization comprising a minor portion by weight of the polymer of a residue of at least one optionally substituted compound selected from the carboxylic acid anhydrides of benzene, naphthalene, biphenyl and the (C_5–C_{10}) cycloalkanes and the corresponding carboxylic acids of benzene, naphthalene, biphenyl and the (C_5–C_{10}) cycloalkanes, provided that no residue bear fewer than two but not more than four carboxylic acid groups, and provided that at least some portion of the compound or compounds bearing such residue or residues is not present in the monomer mixture in which polymerization is first initiated.

4,619,965

DISPERSION STABILIZER AND ITS USE

Keizou Ishii, Ashiya; Takeo Kurauchi, Neyagawa; Jun Nozue, Hirakata, and Shinichi Ishikura, Kyoto, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation of Ser. No. 647,145, Sep. 4, 1984, abandoned. This application Feb. 21, 1986, Ser. No. 833,514

Claims priority, application Japan, Jul. 19, 1984, 59-150949

Int. Cl.[4] C08L *41/00*

U.S. Cl. 524—547 **18 Claims**

1. A dispersion stabilizer for dispersing solid particles into a liquid medium, which comprises resin particles bearing a zwitter-ionic group in the molecule, said resin particles each having substantially an average particle size of not more than 1500 Å on measurement by electron microscopic observation.

4,619,966

PROCESS FOR THE PRODUCTION OF COATED SUBSTRATES

Walter Schäfer; Manfred Hajek, both of Cologne; Hanns P. Müller, Odenthal; Rolf Dhein, Krefeld; Rolf Küchenmeister, Krefeld, and Armin Sickert, Krefeld, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 7, 1985, Ser. No. 795,965

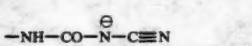
Claims priority, application Fed. Rep. of Germany, Nov. 16, 1984, 3441934

Int. Cl.[4] C08L *75/04*

U.S. Cl. 524—589 7 Claims

1. A process for the production of water-resistant and solvent-resistant coated substrates which comprises

(a) coating a heat-resistant substrate with a solution or dispersion of an anionically-modified polyisocyanate addition product in an aqueous solvent, said polyisocyanate addition product containing chemically incorporated anionic structural units corresponding to the formula



in a quantity of about 5 to 1000 milliequivalents per 100 g of solids, said solids being based on the reaction product of an organic polyisocyanate with a salt based on cyanamide and a base comprising a member selected from the group consisting of ammonia, primary and secondary amines having a minimum pKb of 3.1 which are volatile under the conditions of the thermal treatment, tertiary-amines which are volatile under the conditions of the thermal treatment and mixtures of these bases and

(b) thermally treating the coated substrate at a temperature of about 60° to 200° C. with evaporation or vaporization of the aqueous solvent and cross-linking of the polyisocyanate addition product applied to the substrate.

4,619,967

MULTI-MODAL EMULSIONS OF WATER-SOLUBLE POLYMERS

Richard R. Emerson; Do I. Lee, both of Midland, and James P. Easterly, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 498,222, May 26, 1983, Pat. No. 4,565,836. This application Nov. 2, 1984, Ser. No. 667,782

The portion of the term of this patent subsequent to Jan. 21, 2003, has been disclaimed.

Int. Cl.[4] C08F *2/32*

U.S. Cl. 524—801 19 Claims

1. A water-in-oil emulsion of water-soluble polymer comprising a continuous oil phase and a discontinuous aqueous phase containing said water-soluble polymer, said water-in-oil emulsion comprising small dispersed phase droplets which cluster about a droplet size which ranges from 0.01 μm to 1 μm in diameter and large dispersed phase droplets which cluster about a droplet size which ranges from 1 μm to 40 μm in diameter, wherein said two droplet sizes exist as two identifiable and distinct droplet size distributions.

4,619,968

FLAME RESISTANT CARBONATE BLENDS

David E. Henton, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 12, 1985, Ser. No. 764,364

Int. Cl.[4] C08L *69/00*

U.S. Cl. 525—67 13 Claims

1. A composition comprising:

(1) a continuous phase comprising an aromatic carbonate polymer and

(2) having dispersed therein an elastomeric particle material in the form of a grafted rubber concentrate which comprises

(a) a functionally effective amount of crosslinking

(b) which is further grafted with a functionally effective amount of a vinyl polymer capable of exhibiting flame resistant properties.

4,619,969

POLYOLEFIN COMPOSITION COMPRISING PROPYLENE POLYMER AND ETHYLENE/ANHYDRIDE/ESTER COPOLYMER

Toshiki Doi, Osaka; Hideo Shinonaga, and Tadayuki Omae, both of Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 5, 1985, Ser. No. 795,146

Claims priority, application Japan, Nov. 5, 1984, 59-232992

Int. Cl.[4] C08L *23/12, 23/16, 23/08, 33/06*

U.S. Cl. 525—93 5 Claims

1. A polypropylene-based resin composition comprising (A) from 60 to 99 parts by weight of a polypropylene-based resin selected from the group consisting of crystalline polypropylene and crystalline propylene-α-olefin block or random copolymers and (B) from 1 to 40 parts by weight of an ethylene copolymer composed of from 25 to 98.5% by weight of ethylene, from 0.5 to 15% by weight of an unsaturated dicarboxylic acid anhydride and from 1 to 60% by weight of an unsaturated ester compound having from 4 to 12 carbon atoms and/or a modified copolymer obtained by ring opening addition reaction of the acid anhydride group of said ethylene copolymer with an alcohol having from 1 to 20 carbon atoms.

4,619,970

SEPARATION AGENT

Yoshio Okamoto, Amagasaki, and Koichi Hatada, Ikeda, both of Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

Filed Mar. 7, 1985, Ser. No. 709,004

Claims priority, application Japan, Mar. 19, 1984, 59-53085

Int. Cl.[4] C08F *3/36;* C08G *77/12, 18/04*

U.S. Cl. 525—100 19 Claims

1. A resolving agent for use in chromatographic separation processes, which comprises: silica gel treated with a silane treating agent having an amino, monosubstituted amino, hydroxyl or mercapto group, said silane-treated silica gel being reacted with a polyfunctional organic compound selected from the group consisting of polyfunctional isocyante derivatives and polyfunctional acid chloride derivatives whereby to react a portion of the functional groups of said polyfunctional organic compound with said silica gel, said polyfunctional organic compound also being reacted with an optically active polymer having a functional group reactive with said polyfunctional organic compound whereby to form a bond between said optically active polymer and said polyfunctional organic compound.

4,619,971

LINEAR POLYESTER RESIN BLENDS WITH HIGH IMPACT RESISTANCE

John B. Yates, III, and Timothy J. Ullman, both of Clifton Park, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Mar. 29, 1985, Ser. No. 717,938

Int. Cl.[4] C08L *67/02*

U.S. Cl. 525—166 5 Claims

1. A resinous composition having a notched Izod impact strength at room temperature in excess of 795 joules/m., wherein the resinous components consist essentialy of:

(A) at least one polyester selected from the group consisting of poly(ethylene terephthtalate) and poly(butylene terephthalate), and

(B) a blend of:

(B-1) at least one elastomeric addition copolymer consisting

essentially of structural units derived form acrylonitrile and at least one conjugated diene or a combintation of at least one conjugated diene and at least one acidic monomer, and

(B-2) at least one elastomeric conjugated diene addition homopolymer or copolymer free from nitrile structural units; said blend containing nitrile structural units in an amount to provide from 1% to about 8% by weight of said units in said resinous composition.

4,619,972

MODIFIED ELASTOMER AND LAMINATE THEREOF

Hiroshi Inoue; Makoto Miyazaki; Masaaki Isoi, and Makoto Yoda, all of Saitama, Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 196,076, Oct. 10, 1980, abandoned. This application Mar. 29, 1985, Ser. No. 717,538
Claims priority, application Japan, Oct. 12, 1979, 54-130835
Int. Cl.[4] C08F *279/02*
U.S. Cl. 525—193 **6 Claims**

1. A modified elastomer composition including modified elastomer and crystalline polyolefin prepared by the reaction of:

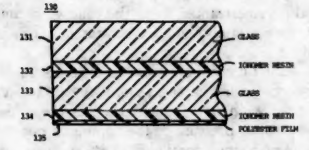
(A) 100 parts by weight of at least one elastomer selected from an ethylene/butene-1 copolymer, a styrene/butadiene copolymer and an ethylene/propylene copolymer wherein the ethylene content of said ethylene/butene-1 copolymer comprises 10 to 90% by weight of said copolymer and its Mooney viscosity at 100° C. is 10 to 200; and wherein the styrene content of said styrene/butadiene copolymer comprises 5 to 70% by weight of said copolymer and its Mooney viscosity at 100° C. is 10 to 200; and wherein the ethylene content of said ethylene/propylene copolymer comprises 10 to 90% by weight of said copolymer, its Mooney viscosity at 100° C. is 10 to 200 and its density is 0.85 to 0.90, and not more than 50 parts by weight of a crystalline polyolefin, with 0.005 to about 0.8 part by weight of an unsaturated carboxylic acid or its anhydride and further including a radical generator and melting and kneading the mixture at 120 to 300° C.

4,619,973

IONOMER RESIN FILMS

W. Novis Smith, Jr., Philadelphia, Pa., assignor to Advanced Glass Systems, Inc., Trumbauersville, Pa.

Filed Aug. 17, 1984, Ser. No. 642,042
Int. Cl.[4] C08F *8/32*
U.S. Cl. 525—329.9 **3 Claims**



1. A sodium ionomer of ethylene methacrylic acid copolymer cross-linked with about 0.3 to about 10% by weight of bis(1,3-aminomethyl)cyclohexane.

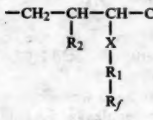
4,619,974

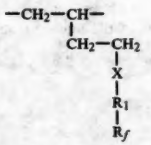
PERFLUOROALKYL SUBSTITUTED POLYMERS

Karl F. Mueller, New York, N.Y., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

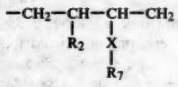
Continuation of Ser. No. 455,099, Jan. 3, 1983, abandoned. This application Dec. 17, 1984, Ser. No. 682,485
Int. Cl.[4] C08F *8/34*
U.S. Cl. 525—332.4 **6 Claims**

1. A perfluoroalkyl-alkylene substituted polymer of 1,4-butadiene or isoprene comprising 40–400 connected monomer carbon atoms in the chain, said chain containing, for every 100 carbon atoms, at least one structural unit selected from A and B

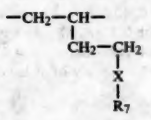

(A)


(B)

wherein X is —S—, SO—, or —SO_2—, said polymer further comprising 0 to 40 mole% of a conventional copolymerizable group (C), and 0 to 20% of at least one structural unit (D) selected from



and



wherein

X is as defined above,

R_1 is either alkylene of from 1 to 16 carbon atoms or is of the structure

wherein

R_1' and R_3 are alkylene groups of 1–16 carbon atoms, with the sum of carbon atoms being no greater than 25;

R_2 is hydrogen or methyl;

Q is —O—, or —NR_4—, wherein

R_4 is hydrogen or alkyl of 1–4 carbon atoms; and

R_f is a linear or branched perfluoroalkyl or perfluoroalkoxyperfluoroalkyl group with 4–20 carbon atoms,

R_7 is an aliphatic, aromatic or aryl-alkylene group of up to 30 carbon atoms which is unsubstituted or substituted by hydroxyl, amino, mono- or di-(lower)alkylamino, carboxy, siloxane or halogen.

4,619,975

NOVEL POLY(ARYL ETHER)- POLYESTER BLOCK COPOLYMERS

Markus Matzner, Edison, N.J., and Donald M. Papuga, Danbury, Conn., assignors to Union Carbide Corporation, Danbury, Conn.

Filed Sep. 5, 1985, Ser. No. 772,881
Int. Cl.[4] C08G 81/00
U.S. Cl. 525—437 38 Claims

1. A block copolymer comprising a poly(aryl ether) block and a liquid crystalline polyester block.

19. A process for preparing a block copolymer comprising a poly(aryl ether) oligomer block and a liquid crystalline polyester block which comprises the following steps:

(a) reacting the dihydroxy terminated oligomer $HO(EO-E'O)_nEOH$ with an anhydride of a lower carboxylic acid $(R_5CO)_2O$ to form the diester $R_5COO(EOE'O)_nEOCOR_5$,

(b) reacting the product from (a) with the diester $R_5COOArOCOR_5$ and the dicarboxylic acid $HOOCAr_1COOH$ under acidolysis conditions, and

(c) recovering the block copolymer, and wherein E and E' are as defined in claim 1, R_5 is lower alkyl and Ar and Ar_1 are divalent aromatic radicals which are residues of the diphenol and diacid components of the liquid crystalline polyester segments.

4,619,976

BLENDS OF COPOLYESTERS AND POLYCARBONATE

John C. Morris, and Winston J. Jackson, Jr., both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 676,908, Nov. 30, 1984, abandoned. This application Nov. 26, 1985, Ser. No. 801,726
Int. Cl.[4] C08L 67/02, 69/00
U.S. Cl. 525—439 5 Claims

1. Composition of matter comprising (a) about 5–95% by weight of a polyester comprising repeating units from about 30 to about 95 mol % terephthalic acid, repeating units from about 5 to about 70 mol % trans-4,4'-stilbenedicarboxylic acid and repeating units from at least 60 mol % 1,4-cyclohexanedimethanol, said polyester having an inherent viscosity of 0.3 or more determined at 25° C. in 60/40 (wt/wt) phenol/tetrachloroethane at a concentration of 0.5 g/100 mL and (b) about 95–5% by weight of a polycarbonate of 4,4'-isopropylidenediphenol with an inherent viscosity of at least 0.3.

4,619,977

CROSSLINKABLE COMPOSITION COMPRISING AMINOEPOXY RESIN-IV

S. Burhan A. Qaderi, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Dec. 10, 1984, Ser. No. 680,112
Int. Cl.[4] C08G 8/30
U.S. Cl. 525—502 28 Claims

1. A substantially gel-free self-crosslinkable conjugated diene functional blocked dieneophile functional aminoepoxy resin of number average molecular weight about 1000–9000, comprising the reaction product of (1) diepoxide with (2) reactants comprising (a) amine functional conjugated diene chain extending reactant, (b) amine functional blocked dieneophile chain extending reactant other than said amine functional conjugated diene chain extending reactant, and (c) modifying agent comprising hydroxy functional secondary amine.

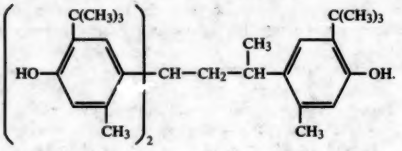
4,619,978

SUBSTITUTED PHENOL CHAIN TERMINATOR FOR POLYVINYL CHLORIDE POLYMERIZATION

William J. Reid, New Fairfield, Conn., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 280,389, Jul. 6, 1981, abandoned. This application Sep. 16, 1982, Ser. No. 418,518
Int. Cl.[4] C08F 2/42, 114/06
U.S. Cl. 526—84 1 Claim

1. In the process for the suspension polymerization of vinyl chloride monomer which comprises adding the monomer to an aqueous reaction system containing effective amounts of a suspending agent and a polymerization initiator, terminating the polymerization reaction and isolating the polyvinyl chloride, the improvement which comprises terminating the polymerization reaction by the addition to the reaction system at a point within the range of 70 to 95% monomer conversion of 25–5000 ppm, by weight of vinyl chloride monomer, of a compound corresponding to the formula



4,619,979

CONTINUOUS FREE RADIAL POLYMERIZATION IN A WIPED-SURFACE REACTOR

Thomas A. Kotnour, Cottage Grove; Ronald L. Barber, Oakdale, and Walter L. Krueger, St. Paul, all of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 28, 1984, Ser. No. 594,278
Int. Cl.[4] C08F 2/02
U.S. Cl. 526—88 15 Claims

1. A process of making a pressure sensitive adhesive composition by bulk polymerizing one or more free radical polymerizable vinyl compounds which comprises:

(a) continuously feeding to a wiped surface reactor comprising a vessel and at least one rotor inside the vessel having a wiping portion located close to the inside surface of the vessel and a root portion spaced substantially further from the inside surface than the wiping portion wherein the root surface is wiped continuously during rotation of the rotor raw materials which comprise unpolymerized vinyl compounds without any substantial amount of polymerized vinyl compounds, and at least two initiators for free radical polymerization under the following conditions:

(i) all raw materials being fed substantially free of oxygen, and

(ii) at least one monomer being a liquid unpolymerized vinyl compound having a viscosity less than about 4,000 centipoise which is fed under a pressure at least as high as the vapor pressure of the combined raw materials at the temperature to which the exotherm of the free radical polymerization brings them in the reactor;

(b) reacting the raw materials to desired conversion; and

(c) continuously withdrawing a polymeric material from the reactor.

4,619,980

POLYMERIZATION CATALYST, METHOD OF MAKING AND USE THEREFOR

Max P. McDaniel, Bartlesville, Okla., and Paul D. Smith, Houston, Tex., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Apr. 1, 1985, Ser. No. 718,668
Int. Cl.[4] C08F 4/62, 4/68
U.S. Cl. 526—96 9 Claims

1. A process for (co)polymerizing ethylene which comprises contacting ethylene and 0–10 mole % of at least one mono-1-olefin having 3–10 carbon atoms at a temperature of 20°–300° C. and a pressure ranging from 0 to 1000 psia in the presence of a catalyst consisting essentially of:

(a) a predominantly silica-containing support treated with in the range of about 0.1–20 mole %, calculated as the metal and based on the untreated support, of at least one compound selected from the group consisting of Group IIA oxide or compounds convertible to the oxide form, a Group VA or VB oxide or compounds convertible to the oxide form or sulfuric acid, and then calcined in an oxygen-containing atmosphere at a temperature in the range of 300°–800° C. for a time in the range of 0.5–20 hours, and thereafter contacted with

(b) 0.01 to 10 wt. % of at least one zerovalent chromium compound, calculated as chromium metal and based on the weight of the treated support prepared as described in (a).

4,619,981

PROCESS FOR PREPARING POLYOLEFINS

Yoshio Tajima; Yoshiharu Iwasaki, both of Tokyo; Kiyoshi Kawabe; Wataru Uchida, both of Yokohama; Shoji Sugita, Kawasaki; Kazuo Matsuura, Tokyo, and Mituji Miyoshi, Fujisawa, all of Japan, assignors to Nippon Oil Company, Limited, Tokyo, Japan

Continuation of Ser. No. 634,387, Jul. 25, 1984, abandoned. This application Aug. 12, 1985, Ser. No. 764,528
Claims priority, application Japan, Jul. 29, 1983, 58-137572
Int. Cl.[4] C08F 4/02, 10/06
U.S. Cl. 526—125 3 Claims

1. A process for preparing a polyolefin by polymerizing at least one α-olefin in the presence of a catalyst, which catalyst consists of the combination of:

[I] a solid catalyst component consisting of a solid material obtained by co-pulverization of the following components (1) to (4), and titanium tetrachloride (5) supported on said solid material:

(1) a magnesium dihalide,

(2) a member selected from the group consisting of vinyltrimethoxysilane, vinyltriethyoxysilane, vinyltriphenoxysilane, allyltrimethoxy silane, allyltriethoxysilane and allyltriphenoxysilane,

(3) a compound selected from the group consisting of phenol and 1-naphthol, and

(4) a member selected from the group consisting of anisole, phenetole, phenyl ether, benzyl phenyl benzyl ether, 1-naphthyl ether and 2-naphthyl ether;

[II] an organoaluminum compound; and

[III] monophenyltriethoxysilane;

wherein the component (1) to component (2) mole ratio is in the range of from 1 to 0.01 to 1 to 1;

the component (1) to component (3) is in the range of from 1 to 0.01 to 1 to 1;

the component (1) to component (4) is in the range of from 1 to 0.01 to 0.25;

the component [III] is used in an amount of 0.01 to 2 moles per mole of said organoaluminum compound;

said α-olefin has 3 to 8 carbon atoms; and

the polymerization reaction is carried out at a temperature in the range of 20° to 200° C. and at a pressure in the range of atmospheric pressure to 70 kg/cm^2.G.

4,619,982

POLYMERIZATION OF CONJUGATED DIENES

Derek K. Jenkins, Ashurst, England, assignor to Enoxy Chemical Limited, Southampton, England

Filed Mar. 31, 1983, Ser. No. 480,806
Claims priority, application United Kingdom, Apr. 1, 1982, 8209712
Int. Cl.[4] C08F 4/52
U.S. Cl. 526—164 9 Claims

1. A process for the homopolymerisation of a conjugated diene or the copolymerisation of a conjugated diene with one or more other conjugated dienes as the sole polymerisable compound to produce a high trans content polymer comprising carrying out the polymerisation in the presence as a catalyst of a mixture of (a) a rear earth compound which is a rare earth carboxylate, a rare earth alkoxide or rare earth diketone complex and (b) a dialkyl magnesium compound as the sole catalyst.

4,619,983

COPOLYMER FOR FLUORINE-CONTAINING ELASTOMER HAVING EXCELLENT LOW TEMPERATURE RESISTANCE AND ALCOHOL RESISTANCE

Masaaki Yamabe; Gen Kojima, both of Machida; Hiroshi Wachi, and Shun-ichi Kodama, both of Yokohama, all of Japan, assignors to Asahi Glass Company Limited, Tokyo, Japan

Continuation of Ser. No. 489,347, Apr. 28, 1983, abandoned, which is a continuation of Ser. No. 328,387, Dec. 7, 1981, Pat. No. 4,418,186. This application Jan. 28, 1985, Ser. No. 694,920
Claims priority, application Japan, Dec. 26, 1980, 55-183780
The portion of the term of this patent subsequent to Nov. 29, 2000, has been disclaimed.
Int. Cl.[4] C08F 214/16, 214/18, 214/22
U.S. Cl. 526—247 4 Claims

1. A fluorine-containing elastomer having excellent low temperature resistance and alcohol resistance, which consists essentially of a copolymer composed of vinylidene fluoride units and fluorovinyl ether units having the formula CF_2=CFOX, wherein X is a C_3–C_9 perfluoroalkyl group which has an ether bond or bonds having 1–3 oxygen atoms at a molar ratio of vinylidene fluoride units to fluorovinyl ether units of 91:9 to 72.3:27.7, and a total content of the units of at least 80 mole percent, based on the total copolymer, with the balance of up to 20 mole percent being at least one comonomer selected from the group consisting of chlorotrifluoroethylene, vinyl fluoride, ethylene, propylene, isobutylene, butene-1, perfluoro(propyl vinyl ether), perfluoro(methyl vinyl ether), ethyl vinyl ether, 2-chloroethyl vinyl ether, and vinyl monochloroacetate, wherein said elastomer has an inherent viscosity of about 0.54 to 2.13 dl/g. obtained in a 90:10 mixture of trifluorotrichloroethylene and dimethylformamide at 30° C., a thermal decomposition temperature of from 388° C. to 412° C. and a glass transition temperature of from −29° C. to −36° C.

4,619,984

PACKING FOR USE IN RESOLUTION

Yoichi Yuki, and Akito Ichida, both of Himeji, Japan, assignors to Daicel Chemical Industries, Ltd., Sakai, Japan

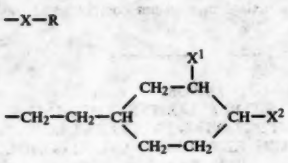
PCT No. PCT/JP84/00369, § 371 Date Mar. 15, 1985, § 102(e) Date Mar. 15, 1985, PCT Pub. No. WO85/00661, PCT Pub. Date Feb. 14, 1985
PCT Filed Jul. 20, 1984, Ser. No. 717,267
Claims priority, application Japan, Jul. 20, 1983, 58-132361; Aug. 19, 1983, 58-150383; Aug. 26, 1983, 58-154993
Int. Cl.[4] C08G 77/26
U.S. Cl. 528—38 18 Claims

1. A packing for use in the optical resolution of racemic compounds, comprising a substance of the general formula (I):

(I)

wherein at least one of Y^1, Y^2 and Y^3 represents a silica gel and siloxane bond with the silica gel and the balance is selected from the group consisting of a hydrogen atom, an alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an aralkyl group having 7 to 20 carbon atoms, a halogen atom, a hydroxy group, and an alkoxy group having 1 to 20 carbon atoms, and

W represents



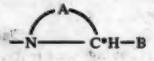
(1)

(2)

(3)
(4)

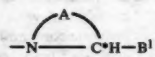
in which X represents a divalent group having 1 to 30 carbon atoms,

R represents an optically active group of the general formula:



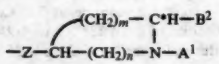
where A is a substituted or unsubstituted alkylene group having 2 or 3 carbon atoms and B is a metal thiocarboxylate group,

one of X^1 and X^2 represents a hydroxy group and the other represents an optically active group of the formula:



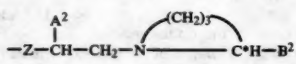
where B^1 is a metal carboxylate group,

R^1 represents an optically active group of the general formula:

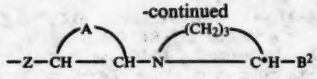


where m and n are each 0 or an integer of 1 to 3 and the total of these numbers is up to 3, B^2 is a copper carboxylate or thiocarboxylate, Z is an oxygen atom, a sulfur atom or an amino group and A^1 is a hydrogen atom, an alkyl group having 1 to 40 carbon atoms, an aryl group having 6 to 40 carbon atoms, an aralkyl group having 7 to 47 carbon atoms or a group having 1 to 40 carbon atoms and a hetero atom, and

R^2 represents an optically active group of the general formula:



-continued



where A^2 is a hydrogen atom, an alkyl group having 1 to 40 carbon atoms, an aryl group having 6 to 40 carbon atoms, an aralkyl group having 7 to 47 carbon atoms or a group having 1 to 40 carbon atoms and a hetero atom, A^3 is alkylene having 2 to 6 carbon atoms and refers to an asymmetric carbon atom.

4,619,985

PROCESS FOR THE PRODUCTION OF DEACTIVATED SUSPENSIONS OF FINELY-DIVIDED POLYISOCYANATES IN RELATIVELY HIGH MOLECULAR WEIGHT COMPOUNDS, DEACTIVATED SUSPENSIONS AND USE THEREOF FOR THE PRODUCTION OF POLYURETHANES

Heinrich Hess; Gerhard Grögler, both of Leverkusen; Richard Kopp, Cologne, and James M. Barnes, Wermelskirchen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed May 8, 1985, Ser. No. 732,028

Claims priority, application Fed. Rep. of Germany, May 18, 1984, 3418430

Int. Cl.[4] C08G *18/30*

U.S. Cl. 528—49 **12 Claims**

1. A process for the production of deactivated suspensions of solid polyisocyanates of retarded reactivity comprising:

(A) reacting

(i) one or more solid, finely divided polyisocyanates having melting points above 30° C. with

(ii) from 0.1 to 25 equivalent percent of reactive groups per isocyanate equivalent of a stabilizer compound having a molecular weight of from 32 to 6000 selected from the group consisting of aliphatic polyamines, hydrazines, alkylhydrazines, N,N'-dialkylhydrazines, polyhydrazides, amidine-group containing compounds, guanidine-group containing compounds, and mixtures thereof, in the presence of

(iii) an organic material having a molecular weight of from 400 to 6000 selected from the group consisting of

(1) compounds containing two or more hydroxyl groups,

(2) compounds containing two or more aromatically-bound amino groups, and

(3) mixtures thereof, to thereby form a suspension of stabilized polyisocyanate in said organic material, and

(B) adding to the suspension of step (A) at a temperature below the melting temperature of the polyisocyanate a deactivator which at least partially deactivates any unreacted quantities of said stabilizer compound.

4,619,986

EPOXY PHTHALONITRILE POLYMERS

Teddy M. Keller, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

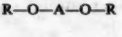
Filed Jun. 28, 1985, Ser. No. 749,705

Int. Cl.[4] C08G *59/40*

U.S. Cl. 528—99 **5 Claims**

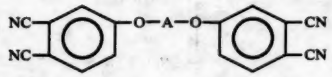
1. A process for producing an epoxy-phthalonitrile copolymer, which comprises:

mixing amounts of an epoxy monomer having the formula,



wherein A is selected from a group consisting of —ϕ—C_nH_{2n}—ϕ—, —ϕ—SO_2—ϕ—, —ϕ—, —C_nH_{2n}—, and —ϕ—ϕ—, wherein n ranges from 1-4, wherein the phenyl groups are linked at the para or meta positions, and

wherein R is selected from the group consisting of linear epoxides having 3–5 carbon atoms; with a phthalonitrile monomer having the formula,



wherein A is selected from a group consisting of —ϕ—C_nH_{2n}—ϕ—, —ϕ—SO_2—ϕ—, —ϕ—, —ϕ—C_nH_{2n}—, and —ϕ—ϕ—, wherein n ranges from 1–4, wherein the phenyl groups are linked at the para or meta positions, said epoxy and phthalonitrile monomers being mixed in a molar ratio ranging from about 20:1 epoxy:phthalonitrile to about 20:1 phthalonitrile:epoxy; and

heating the epoxy-phthalonitrile mixture in the presence of an amine additive selected from the group consisting of m-phenylenediamine, p-phenylenediamine, 4,4'-methylenedianiline, 4-aminophenyl sulfone, 4-aminophenyl ether and 4,4'-(p-phenylenedioxy)dianiline to a temperature sufficient to polymerize said mixture, said temperature being between the polymerization mixture melting point and decomposition temperature.

4,619,987

PROCESS FOR PREPARATION OF HIGH-MOLECULAR WEIGHT POLYESTER

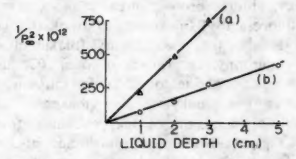
Noritsugu Saiki, and Tadashi Konishi, both of Matsuyama, Japan, assignors to Teijin Limited, Osaka, Japan

Filed Oct. 8, 1985, Ser. No. 785,478

Claims priority, application Japan, Oct. 12, 1984, 59-212588; Oct. 19, 1984, 59-218664; Oct. 26, 1984, 59-224207

Int. Cl.⁴ C08G *63/04, 63/22*

U.S. Cl. 528—274 **17 Claims**



1. A process for preparing a high-molecular weight polyester comprising polymerizing a polyester obtained from a dicarboxylic acid component composed mainly of an aromatic dicarboxylic acid and/or an ester-forming derivative thereof and a glycol component composed mainly of ethylene glycol and/or an ester forming derivative thereof and having an intrinsic viscosity of at least 0.8, at a temperature above the melting point of the polyester and under a reduced pressure, in the presence of a compound (A) successively generating a substance which is gaseous under the polymerization conditions and does not substantially reduce the molecular weight of the polyester, to form a polyester having an intrinsic viscosity of at least 1.0.

4,619,988

HIGH STRENGTH AND HIGH TENSILE MODULUS FIBERS OR POLY(ETHYLENE OXIDE)

Roger Y. Leung, Schaumburg, and Anthony J. Polak, Lake Zurich, both of Ill., assignors to Allied Corporation, Morristown, N.J.

Filed Jun. 26, 1985, Ser. No. 749,073

Int. Cl.⁴ C08G *65/30*

U.S. Cl. 528—421 **12 Claims**

1. A method of making a poly(ethylene oxide) filament with a tensile strength of at least 0.1 GPa and a tensile modulus of at least 0.5 GPa comprising crystallizing poly(ethylene oxide) from a solution containing less than about 5 weight percent of poly(ethylene oxide) of molecular weight greater than about 10^6 in a shear or extensional flow field of the type produced by a Couette viscometer at a temperature from about 35° to about 45° C.

4,619,989

BONE MORPHOGENETIC PROTEIN COMPOSITION

Marshall R. Urist, Pacific Palisades, Calif., assignor to The Regents of the University of Cal., Los Angeles, Calif.

Continuation-in-part of Ser. No. 260,726, May 5, 1981, which is a continuation of Ser. No. 174,906, Aug. 4, 1980, Pat. No. 4,294,753. This application Aug. 16, 1983, Ser. No. 523,606

Int. Cl.⁴ C07K *3/28, 15/06*

U.S. Cl. 530—417 **5 Claims**

1. The process of isolating substantially pure BMP composition comprising the steps of:

(a) demineralizing bone tissue;

(b) treating said demineralized bone tissue under aqueous conditions with a water soluble neutral salt and a solubilizing agent for BMP composition, said agent being selected from the group consisting of urea and quanidine, and thereby transforming the bone collagen to gelatin and extracting BMP composition into said solution of solubilizing agent;

(c) separating said solubilizing agent and neutral salt from said solution thereby precipitating BMP composition in the aqueous medium;

(d) dissolving said BMP composition precipitate in a solubilizing agent as defined in (b) above, and dialyzing said dissolved BMP composition against a less concentrated solution of said solubilizing agent; and

(e) dialyzing supernatant obtained in step (d) against water thereby precipitating substantially pure BMP composition.

4,619,990

POLYMERIC DYES WITH PENDENT CHROMOPHORE GROUPS CAPABLE OF UNDERGOING THERMOPLASTIC DEFORMATION

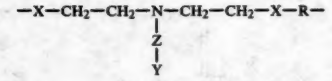
Mohamed A. Elmasry, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 11, 1985, Ser. No. 710,174

Int. Cl.⁴ C07C *107/04, 107/06;* **D09B** *1/16, 23/00, 43/00, 43/20, 43/22, 57/00*

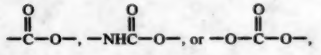
U.S. Cl. 534—573 **15 Claims**

1. A polymeric dye selected from classes [A] and [B] wherein Class [A] is a dye polymer comprising repeating units of the formula



said repeating units numbering between 5 and 100,000, wherein

X is



R is a hydrocarbon chain with up to 30 carbon atoms selected from the class consisting of straight chain aliphatic, branched chain aliphatic, cycloaliphatic, single or fused ring aromatic,

Z is (1) phenylene or naphthlene, or (2) a single bond when Y is an anthraquinone moiety,

Y is a chromophore moiety selected from the group consist-

ing of an azo moiety, tricyanovinyl moiety, an anthraquinone moiety, and a methine or a polymethine moiety, and Class [B] is a dye polymer consisting essentially of units of copolymers derived from ethylenically-unsaturated monomers, at least one of which is a monomer of subclass III and at least one of which is a monomer of subclass IV wherein

Subclass III is a non-chromophore-containing monomer selected from the group consisting of
(meth)acrylate monomer,
(meth)acrylamide monomer,
vinyl ether monomer,
vinyl ester monomer, and
meth(acrylonitrile) monomer, and

Subclass IV is selected from the group consisting of
(meth)acrylate dye,
vinyl ester dye, and
vinyl ether dye,
with the proviso that Class IV monomers contain a pendent tricyanovinyl, methine, or polymethine dye group.

4,619,991
PROCESS FOR THE PRODUCTION OF AZO COMPOUNDS

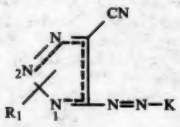
Peter Matzinger, Zürich, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Continuation of Ser. No. 305,608, Sep. 25, 1981, abandoned, which is a continuation of Ser. No. 120,137, Feb. 11, 1980, abandoned. This application Aug. 18, 1982, Ser. No. 409,300

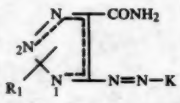
Int. Cl.[4] C09B *29/036, 43/00*

U.S. Cl. 534—588 **20 Claims**

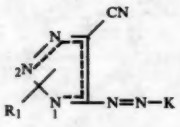
1. A process for the synthesis of a compound of the formula



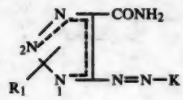
comprising treating a compound of the formula



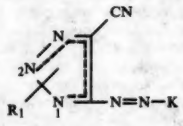
with a dehydrating agent to obtain a compound of the formula



said dehydrating agent being an agent capable of dehydrating a compound of the formula



to a compound of the formula



wherein

R_1 is hydrogen; C_{1-4}alkyl; C_{1-4}alkyl monosubstituted by fluoro, chloro, bromo, (C_{1-4}alkyl)carbonyl, C_{1-4}alkoxy, cyano, thiocyano, phenoxy, (C_{1-4}-alkoxy)carbonyl, phenoxycarbonyl, (C_{1-4}alkoxy)-ethoxycarbonyl, (C_{1-4}alkyl)-carbamoyl, di-(C_{1-4}-alkyl)carbamoyl, phenylcarbamoyl, N-C_{1-4}alkyl-N-phenylcarbamoyl, benzoyl, (C_{1-4}alkyl)-carbonyloxy, phenylsulfonyl, C_{1-4}alkylsulfonyl, sulfamoyl, C_{1-4}alkylsulfamoyl, di-(C_{1-4}alkyl)sulfamoyl, phenylsulfamoyl, N-C_{1-4}alkyl-N-phenylsulfamoyl, phenyl or substituted phenyl having 1 or 2 substituents each of which is independently chloro, bromo, nitro, cyano, trifluoromethyl, C_{1-4}alkyl or C_{1-4}alkoxy; C_{2-4}alkenyl; C_{2-4}alkenyl monosubstituted by chloro, bromo or phenyl; C_{2-4}alkynyl; phenyl or substituted phenyl having 1 to 3 substituents each of which is independently C_{1-4}alkyl, C_{1-4}alkoxy, chloro, bromo, nitro, cyano (maximum of two), trifluoromethyl (maximum of two), (C_{1-4}alkoxy)-carbonyl (maximum of two), formyl (maximum of one), (C_{1-4}-alkyl)carbonyl (maximum of one), (C_{1-4}alkyl)carbamoyl (maximum of one), di-(C_{1-4}alkyl)carbamoyl (maximum of one), C_{1-4}alkylsulfonyl (maximum of one), phenylsulfonyl (maximum of one), sulfamoyl (maximum of one), C_{1-4}-alkylsulfamoyl (maximum of one), di-(C_{1-4}alkyl)sulfamoyl (maximum of one) or phenylsulfamoyl (maximum of one), with the proviso that R_1 is in the 1-position of the triazole ring and the broken line represents double bonds in the 2,3- and 4,5-positions or R_1 is in the 2-position of the triazole ring and the broken line represents double bonds in the 3,4- and 1,5-positions, and

K is a coupling component radical.

4,619,992
3-(β-AMINOETHYL)-4-CYANO-ISOTHIAZOLYLAZO DYES

Udo Bergmann, Darmstadt; Johannes P. Dix, Neuhofen; Guenter Hansen, and Ernst Schefczik, both of Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Rheinland-Pfalz, Fed. Rep. of Germany

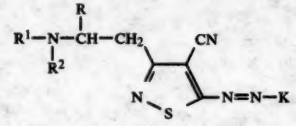
Filed Mar. 12, 1985, Ser. No. 710,993

Claims priority, application Fed. Rep. of Germany, Mar. 14, 1984, 3409243

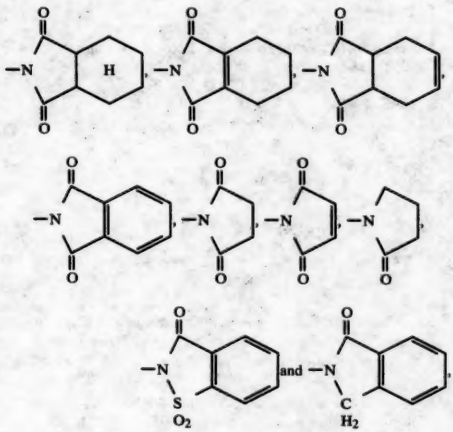
Int. Cl.[4] C09B *29/039;* **D06P** *1/18, 3/54*

U.S. Cl. 534—733 **4 Claims**

1. A compound of the formula:



where R is hydrogen, C_1–C_4-alkyl, phenyl, chlorophenyl, methylphenyl, methoxyphenyl or nitrophenyl; R^1 is allyl, C_1–C_8-alkyl, C_1–C_8-alkyl substituted by C_1–C_8-alkoxy, phenoxy, phenyl or C_1–C_8-alkanoyloxy, cyclopentyl, cyclohexyl, and methylcyclohexyl, norbornyl, phenyl or phenyl substituted by chlorine, methyl or alkoxy; R^2 is C_1–C_{10}-alkanoyl, C_1–C_{10}-alkanoyl substituted by alkoxy or phenoxy, cyclohexanoyl, benzoyl, benzoyl substituted by chlorine, methyl or methoxy, C_1–C_8-alkoxycarbonyl, aminocarbonyl, phenylaminocarbonyl, CH_3NHCO, C_2H_5NHCO, C_3H_7NHCO, C_4H_9NHCO, $(CH_3)_2NCO$, CH_3SO_2, $C_6H_5SO_2$ or p—CH_3—C_3H_4—SO_2; or R^1 and R^2, together with the nitrogen atom, form a ring system selected from the group consisting of:



and K is a radical of a coupling component.

4,619,993

AZO COMPOUNDS HAVING A 2,4-DINITRO-5-THIOCYANOPHENYL DIAZO COMPONENT RADICAL

Werner Baumann, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

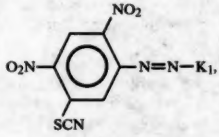
Continuation-in-part of Ser. No. 459,730, Jan. 20, 1983, abandoned. This application Jul. 18, 1984, Ser. No. 631,930

Claims priority, application Fed. Rep. of Germany, Jan. 23, 1982, 3202117

Int. Cl.[4] C09B *29/01, 29/085, 29/36, 29/44*

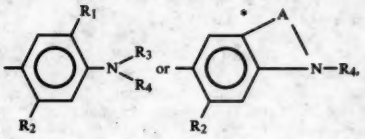
U.S. Cl. 534—735 **18 Claims**

1. A compound of the formula



wherein

K_1 is



wherein

A is C_{3-7}alkylene or —O—C_{2-4}alkylene, with the proviso that the oxygen atom of the —O—C_{2-4}alkylene-radical is attached to the asterisked atom,

R_1 is hydrogen, chloro, bromo, C_{1-4}-alkyl, C_{1-4}alkoxy, benzyloxy or —O—$(CH_2)_n$—A_1—C_{1-6}alkyl,

wherein

A_1 is —O—, —O—CO—, —O—CO—O— or —CO—O—, and

n is 1, 2, 3, 4, 5 or 6

R_2 is hydrogen, chloro, bromo, C_{1-2}alkyl, C_{1-4}alkoxy, phenyl(C_{1-3}alkoxy), acyloxy or acylamino, and each of

R_3 and R_4 is independently hydrogen; C_{1-12}alkyl; C_{3-4}alkenyl; C_{3-4}alkynyl; benzyl; C_{2-6}alkyl substituted by 1 or 2 substituents each of which is independently hydroxy, C_{1-4}alkoxy, acyloxy, chloro, bromo, cyano, phenyl or phenoxy; or —$(CH_2)_n$—A_1—C_{1-6}alkyl,

wherein

A_1 and n are as defined above, with the proviso that any —$(CH_2)_n$—A_1—C_{1-6}alkyl as R_3 or R_4 is other than —$(CH_2)_m$—O—C_{1-4}-alkyl, —$(CH_2)_m$—O—CO—C_{1-6}alkyl and —$(CH_2)_m$—O—CO—O—C_{1-6}alkyl,

wherein

m is 2, 3, 4, 5 or 6.

4,619,994

BENZENEAZO POLYNUCLEAR AROMATIC OR HETEROAROMATIC AMIDINE COMPOUNDS CONTAINING AMIDINE SUBSTITUENTS

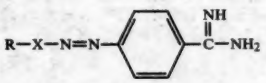
Douglas Shortridge, 36, Parkside Road., Leeds, West Yorkshire LS6 4QG, England

Continuation of Ser. No. 488,717, Apr. 26, 1983, abandoned. This application Jul. 25, 1985, Ser. No. 759,493

Int. Cl.[4] C07C *107/00, 107/04, 107/08;* **A61K** *31/655*

U.S. Cl. 534—738 **5 Claims**

1. A compound of the formula



where X is a polynuclear aromatic or heteroaromatic group having from 2 to 4 fused rings which is unsubstituted or substituted by hydroxyl or C_1–C_2 alkyl; and R is hydrogen or a group of the formula

or an acid addition salt of said compound.

4,619,995
N,O-CARBOXYMETHYL CHITOSAN AND PREPARATIVE METHOD THEREFOR

Ernest R. Hayes, Wolfville, Canada, assignor to Nova Chem Limited, Halifax, Canada

Filed Dec. 24, 1984, Ser. No. 685,559
Int. Cl.[4] C08B *37/08*
U.S. Cl. 536—20 **8 Claims**

1. N,O-carboxymethyl chitosan having a degree of substitution of carboxymethyl groups per glucosamine monomer unit in the chitosan of less than 1.0, with carboxymethyl groups being substituted on hydroxyl oxygen atoms of the glucosamine monomer units of the chitosan and carboxymethyl groups being substituted on nitrogen atoms of the glucosamine monomer units of the chitosan.

4,619,996
PROCESS FOR PREPARING 2-β-D-RIBOFURANOSYLSELENAZOLE-4-CARBOXAMIDE

P. Dan Cook, and Dennis J. McNamara, both of Ann Arbor, Mich., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Jul. 9, 1984, Ser. No. 629,287
Int. Cl.[4] C07H *1/00*
U.S. Cl. 536—55.3 **1 Claim**

1. A process for preparing 2-β-D-ribofuranosylselenazole-4-carboxamide comprising the steps of:

(a) reacting 2,3,5-tri-O-benzoyl-β-D-ribofuranosyl-1-carbonitrile with gaseous hydrogen selenide in a 1:1 to 1:5 molar ratio at a temperature of between about 10° C. to about 30° C. for a period of less than three hours to effect substantially complete conversion of said 2,3,5-tri-O-benzoyl-β-D-ribofuranosyl-1-carbonitrile to 2,5-anhydro-3,4,6-tri-O-benzoyl-β-D-allonselenocarboxamide;

(b) reacting said 2,5-anhydro-3,4,6-tri-O-benzoyl-β-D-allonselenocarboxamide with ethyl bromopyruvate to produce ethyl 2-(2,3,5-tri-O-benzoyl-β-D-ribofuranosyl)-selenazole-4-carboxylate;

(c) reacting said ethyl 2-(2,3,5-tri-O-benzoyl-β-D-ribofuranosyl)selenazole-4-carboxylate with sodium methoxide to produce methyl 2-β-D-ribofuranosyl-selenazole-4-carboxylate; and

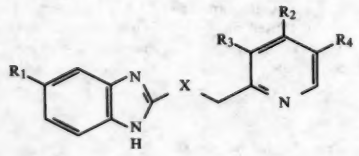
(d) thereafter reacting said methyl 2-β-D-ribofuranosyn-selenazole-4-carboxylate with ammonia to product 2-β-D-ribofuranosylselenazole-4-carboxamide.

4,619,997
SUBSTITUTED 2-PYRIDYLMETHYLTHIO AND SULFINYL-BENZIMIDAZOLES AS GASTRIC ANTISECRETORY AGENTS

John C. Sih, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 648,118, Sep. 6, 1984, Pat. No. 4,575,554, which is a continuation-in-part of Ser. No. 558,087, Dec. 5, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,224
Int. Cl.[4] C07D *401/14, 413/14*
U.S. Cl. 544—124 **2 Claims**

1. A compound of the formula I:



I

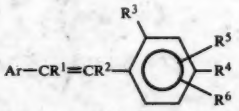
wherein X is
(a) =S, or
(b) =SO;
wherein R_1 is
(a) hydrogen,
(b) methyl,
(c) methoxy, or
(d) trifluoromethyl;
wherein R_2 is
(a) $-N(R_4)_2$
(b) 1-piperidinyl,
(c) 4-morpholinyl,
(d) 4-methyl-piperazin-1-yl, or
(e) 1-pyrrolidinyl;
wherein R_3 and R_4 are the same or different and are
(a) hydrogen, or
(b) (C_1-C_4)alkyl.

4,619,998
LIGHT-SENSITIVE TRIAZINES POSSESSING TRICHLOROMETHYL GROUPS

Gerhard Buhr, Koenigstein, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

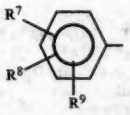
Filed Oct. 12, 1984, Ser. No. 660,098
Claims priority, application Fed. Rep. of Germany, Oct. 12, 1983, 3337024
Int. Cl.[4] C07D *251/20*
U.S. Cl. 544—193.1 **8 Claims**

1. A light sensitive compound have the formula



(I)

wherein
R^1 and R^2 each is a hydrogen atom or a lower alkyl group,
R^3 and R^4 are different from one another and each is a hydrogen atom or a 4,6-bis-trichloromethyl-s-triazin-2-yl group,
R^5 and R^6 are identical or different and each is a hydrogen atom, a halogen atom, an alkyl group having 1 to 3 carbon atoms, or a methoxy group, and
Ar is (i) a mononuclear group having the formula,



(II)

wherein R^7, R^8 and R^9 are identical or different and each is a hydrogen atom; a halogen atom; an unsubstituted alkyl group or an alkyl group substituted by halogen, carbocyclic aryl or carbocyclic aryloxy, such that any two of R^7 through R^9 can be connected together to form an ortho-fused 5- or 6-membered ring wherein one or two of the ring carbons can be replaced by an O- or a S-atom; a cycloalkyl group; an alkenyl group; an aryl group; or an aryloxy group, the total number of carbon atoms for R^7, R^8 and R^9 being 12,
or (ii) a carbocyclic binuclear or trinuclear group which is unsubstituted or substituted by halogen, an alkyl group having 1 to 3 carbon atoms, an alkoxy group having 1 to 4 atoms, or an alkoxy-alkyl group having 3 to 6 carbon atoms.

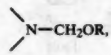
4,619,999

ALIPHATIC ISOCYANATE COMPOUNDS

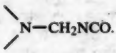
Girish G. Parekh, Fairfield, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed Feb. 15, 1983, Ser. No. 466,755
Int. Cl.[4] C07D *251/00*; C07C *118/00*; C08G *12/30, 12/12*
U.S. Cl. 544—196 5 Claims

1. A method of making an aliphatic isocyanate compound, comprising reacting isocyanic acid with a compound containing at least one N-alkoxymethyl group of the formula



wherein R is C_1-C_8 alkyl, to form said aliphatic isocyanate containing at least one N-isocyanatomethyl group of the formula



4,620,000

METHOD FOR PREPARING 4-HYDROXYCINNOLINES IN A PH CONTROLLED SYSTEM

Lucian R. Denes, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed May 28, 1985, Ser. No. 737,963
Int. Cl.[4] C07D *237/28*
U.S. Cl. 544—235 2 Claims

1. In a method for the preparation of a 4-hydroxycinnoline wherein the diazonium salt of a 2-aminoacetophenone in aqueous solution is allowed to undergo cyclocondensation, the improvement that comprises conducting the cyclocondensation in the presence of a buffering agent and an essentially water-immiscible organic liquid, maintaining the pH of the solution between about 4.0 and 8.5.

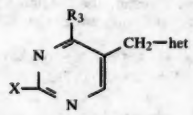
4,620,001

CHEMICAL METHODS AND INTERMEDIATES FOR PREPARING SUBSTITUTED PYRIMIDINONES

Bing L. Lam, King of Prussia, and Lendon N. Pridgen, Audubon, both of Pa., assignors to SmithKline Beckman Corporation, Philadelphia, Pa.

Division of Ser. No. 366,443, Apr. 7, 1982, Pat. No. 4,477,663, which is a division of Ser. No. 232,105, Feb. 6, 1981, Pat. No. 4,352,933. This application Sep. 11, 1984, Ser. No. 649,394
Int. Cl.[4] C07D *401/06*
U.S. Cl. 544—310 6 Claims

1. A compound of the basic formula:



in which:

R_3 is —Cl, —Br, lower alkoxy of 1–5 carbons, benzyloxy, allyloxy, phenoxy, 2-methoxyethoxy or 2,2,2-trichloroethoxy;

X is —Cl, —Br or, when R_3 is other than —Cl or —Br, lower alkoxy of 1–5 carbons; and

het is selected from the group consisting of 2-pyridyl, 3-pyridyl, 4-pyridyl, 2-thiazolyl, 2-oxazolyl, 2-imidazolyl, 2-pyrimidyl and 2-pyrazyl, said het optionally monosubstituted by methyl, ethyl, methoxy or ethoxy, or an acid addition salt thereof with hydrochloric, hydriodic, acetic, hydrobromic, sulfuric, phosphoric, oxalic, formic, ethanedisulfonic or methanesulfonic acid.

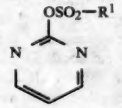
4,620,002

2-PYRIMIDYL ALKANESULFONATES

Louise O. Sandefur; Wojciech Slusarek, both of Rochester; Burton D. Wilson, Webster, and Cataldo A. Maggiulli, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,223
Int. Cl.[4] C07D *239/34*
U.S. Cl. 544—318 2 Claims

1. A 2-pyrimidyl alkanesulfonate represented by the structural formula



wherein R^1 represents an alkyl group having from 1 to 3 carbon atoms.

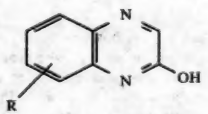
4,620,003

PROCESS FOR PRODUCING 2-QUINOXALINOLS

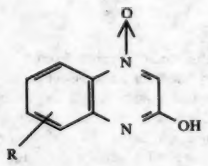
Tsukasa Ishikura, Ageo, Japan, assignor to Nippon Kayaku Kabushiki Kaisha, Tokyo, Japan

Filed May 18, 1984, Ser. No. 611,969
Claims priority, application Japan, May 25, 1983, 58-90771
Int. Cl.[4] C07D *241/44*; C07B *1/00*
U.S. Cl. 544—354 7 Claims

1. A process for preparing a 2-quinoxalinol compound of the formula:



in which R is hydrogen, halogen or a trifluoromethyl group, which comprises reducing a 2-quinoxalinol-4-oxide compound of the formula:



where R is as defined above, with hydrazine in the presence of a Raney catalyst and an alkali metal hydroxide, an alkaline earth metal hydroxide, or ammonium hydroxide.

4,620,004
POLYHETEROCYCLIC COMPOUNDS

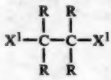
Edward B. Sanders, and Yoram Houminer, both of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Division of Ser. No. 45,716, Jun. 5, 1979, Pat. No. 4,318,418.
This application Dec. 23, 1980, Ser. No. 220,196
Int. Cl.[4] C07D *241/02*
U.S. Cl. 544—357 10 Claims

9. A process for preparing a polyheterocyclic compound which comprises the steps of (1) dissolving and interacting in a solvent medium a basic reagent and an organic compound corresponding to the formula:

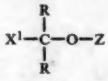
where R is a substituent selected from hydrogen and alkyl groups containing between 1 and about 10 carbon atoms; X^1 is a substituent selected from pyrazyl, alkyl-substituted pyrazyl, pyridyl and alkyl-substituted pyridyl, where each alkyl group contains between 1 and about 10 carbon atoms, and the X^1 substituent contains a total of between 4 and about 22 carbon atoms; and any adjacent R and X or any adjacent R and X^1 when taken together with connecting elements form an alicyclic structure; wherein the interaction converts the organic compound into an anion corresponding to the structure:

where R and X^1 are as previously defined; and (2) treating the solvent medium containing the anion with a coupling reagent to cause dimeric coupling of the anion to form a polyheterocyclic compound corresponding to the formula:



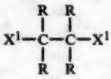
where R and X^1 are as previously defined.

10. A process for preparing a polyheterocyclic compound which comprises dissolving and interacting in a solvent medium (a) a basic reagent, (b) at least one sulfonate ester compound corresponding to the formula:



where R is a substituent selected from hydrogen and alkyl groups containing between 1 and about 10 carbon atoms; X^1 is a substituent selected from pyrazyl, alkyl-substituted pyrazyl, pyridyl and alkyl-substituted pyridyl, where each alkyl group contains between 1 and about 10 carbon atoms, and the X^1 substituent contains a total of between 4 and about 22 carbon atoms; and any adjacent R and X or any adjacent R and X^1 when taken together with connecting elements form an alicyclic structure; and Z is an organosulfonyl radical, and (c) at least one compound corresponding to the formula:

where R and X^1 are as previously defined; wherein the interaction yields a polyheterocyclic compound corresponding to the formula:



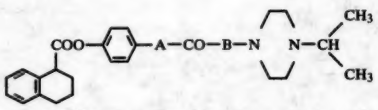
where R and X^1 are as previously defined.

4,620,005
1-ISOPROPYL-4[(4-TETRAHYDRO-1-NAPHTHOYLOXY PHENYL)(ALKYLENE)-CARBONYL(OXYMETHLCARBONYL)]PIPERAZINES HAVING CHYMOTRYPSIN-INHIBITORY ACTIVITY

Setsuro Fujii, Toyonaka; Eizou Hattori, Sakado; Mitsuteru Hirata, Saitama; Hisashi Kunieda, Higashi-Murayama; Koichiro Watanabe, Niiza, and Hiroshi Ishihama, Higashi-Murayama, all of Japan, assignors to Kowa Co., Ltd., Nagoya, Japan

Continuation of Ser. No. 613,058, May 22, 1984, abandoned.
This application Oct. 17, 1985, Ser. No. 787,714
Claims priority, application Japan, Jun. 2, 1983, 58-98713
Int. Cl.[4] C07D *241/04;* A61K *31/495*
U.S. Cl. 544—391 4 Claims

1. A phenyl tetrahydronaphthylcarboxylate having the formula:



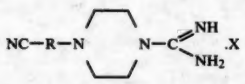
wherein A is a direct bond, or a lower alkylene group and B is a direct bond, or a —OCH_2CO— group, with the proviso that A and B are not direct bonds simultaneously.

4,620,006
ACID SALTS OF 1-(CYANOALKYL)-4-GUANYLPIPERAZINES

Louise O. Sandefur; Wojciech Slusarek, both of Rochester; Burton D. Wilson, Webster, and Cataldo A. Maggiulli, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 11, 1982, Ser. No. 407,215
Int. Cl.[4] C07D *295/12*
U.S. Cl. 544—402 4 Claims

1. A 1-(cyanoalkyl)-4-guanylpiperazine acid salt represented by the structural formula



wherein R represents an alkylene group having from 1 to 5 carbon atoms and x represents an acid.

4,620,007

6-FLUORO-7-CHLORO-1-CYCLOPROPYL-4-OXO-1,4-DIHYDRO-QUINOLINE-3-CARBOXYLIC ACID

Klaus Grohe, Odenthal; Hans-Joachim Zeiler, Velbert, and Karl G. Metzger, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 614,923, May 29, 1984, which is a continuation-in-part of Ser. No. 436,112, Oct. 22, 1982, abandoned, which is a continuation-in-part of Ser. No. 292,560, Aug. 13, 1981, abandoned. This application Dec. 11, 1985, Ser. No. 807,554

Claims priority, application Fed. Rep. of Germany, Sep. 3, 1980, 3033157; Oct. 29, 1981, 3142854

Int. Cl.[4] C07D *215/14*

U.S. Cl. 546—156 1 Claim

1. 1-cyclopropyl-6-fluoro-1,4-dihydro-4-oxo-7-chloro-quinoline-3-carboxylic acid.

4,620,008

PROCESSES FOR THE PREPARATION OF OMEPRAZOLE AND INTERMEDIATES THEREFORE

Arne E. Brändström, and Bo R. Lamm, both of Göteborg, Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

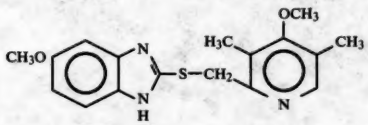
Division of Ser. No. 526,900, Aug. 26, 1983, Pat. No. 4,544,750. This application Feb. 1, 1985, Ser. No. 697,396

Claims priority, application Sweden, Aug. 26, 1982, 8204879

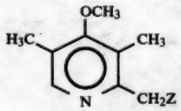
Int. Cl.[4] C07D *213/68, 401/12*

U.S. Cl. 546—271 3 Claims

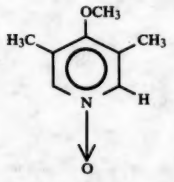
2. In a method for the preparation of a compound of the formula



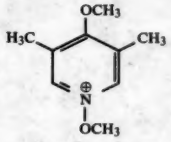
by reacting a reactive pyridine derivative of the formula



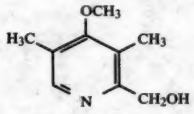
where Z is hydroxy, halogen or p-toluene-sulfonyl, with a substituted benzimidazole, the improvement comprising forming the reactive pyridine derivative by reacting a compound of the formula



with dimethyl sulfate to form the intermediate



whereafter CH_3OH is added in the presence of a source of free radicals to give a hydroxy compound of the formula



and, in the case where Z is not hydroxy, further reacting the hydroxy compound with a reagent selected from the group consisting of halogenating agents and p-toluene sulfonic acid.

4,620,009

SYNTHESIS OF INTERMEDIATES FOR TETRAMISOLE, LEVAMISOLE AND THEIR DERIVATIVES

Sivaraman Raghu, Norwalk; Arthur K. Hoffmann, New Canaan, and Balwant Singh, Stamford, all of Conn., assignors to Cyanamid Agricultural de Puerto Rico, Inc., Manati, P.R.

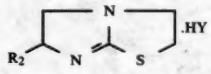
Division of Ser. No. 131,293, Mar. 17, 1980, Pat. No. 4,310,672, which is a continuation of Ser. No. 958,237, Nov. 6, 1978, abandoned, which is a division of Ser. No. 884,674, Mar. 8, 1978, Pat. No. 4,139,707, which is a division of Ser. No. 739,924, Nov. 8, 1976, Pat. No. 4,090,025, which is a continuation-in-part of Ser. No. 680,311, Apr. 26, 1976, abandoned. This application Oct. 1, 1981, Ser. No. 307,459

The portion of the term of this patent subsequent to Jan. 25, 2000, has been disclaimed.

Int. Cl.[4] C07D *513/04*

U.S. Cl. 548—155 8 Claims

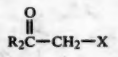
1. A method for the preparation of a compound of the formula:



(VII)

which comprises:

reacting an α-substituted ketone of the formula:

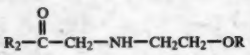


(I)

wherein R_2 is phenyl or phenyl substituted with up to two groups of lower alkyl, lower alkoxy, halogen or trifluoromethyl and X is a substituent which can be displaced by a nucleophilic reagent with an amine of the formula:

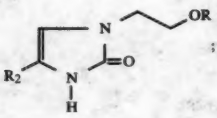
$$H_2N—CH_2CH_2OR \quad \text{(II)}$$

or its acid addition salts wherein R is hydrogen, C_1–C_6 alkyl, halo C_1–C_6 alkyl, phenyl optionally substituted with up to three groups of lower alkyl, halogen or lower alkoxy or the formula COR_3 wherein R_3 is hydrogen, C_1–C_6 alkyl, halo C_1–C_6 alkyl, phenyl or phenyl substituted with up to four groups of lower alkyl, halogen, lower alkoxy or trifluoromethyl to produce a compound of the formula:



(III)

dissolving compound III in an organic solvent heated from 0° to about 100° C. in the presence of cyanic acid and a hydronium ion source to yield a compound of the formula:

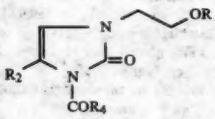


(IV)

reacting the compound of formula IV with an acyl halide or acyl anhydride of the formula:

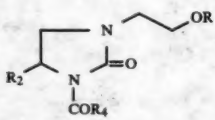
R_4COZ or $(R_4CO)_2O$

wherein R_4 is C_1–C_6 alkyl, C_1–C_6 alkoxy, phenoxy, C_5–C_{10} cycloalkyl, phenyl or phenoxy substituted with up to four groups of lower alkyl, lower alkoxy, halogen or trifluoromethyl and Z is any group which can be displaced by a nucleophilic reagent in the presence of a hydroxide ion source while refluxing neat or in a hydrocarbon solvent to produce an imidazolinone of the formula:



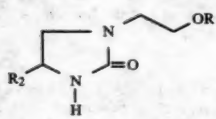
(IVa)

hydrogenating the compound of formula VIa at about 15 to about 1000 psi of hydrogen to produce an imidazolidone of the formula:



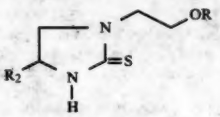
(IVb)

hydrolyzing the compound of formula IVb in the presence of a hydroxide ion source in either water or alcohol at a temperature from about 70° to 100° C. to produce an imidazolidone of the formula:



(V)

heating the imidazolidone of formula V in an inert solvent at a temperature from about 80° to about 200° C. in the presence of a reagent capable of substituting sulfur for oxygen to yield an imidazolidinethione of the formula:



(VI)

and some of a compound of formula VII, above; and

heating the compound of formula VI with HY wherein Y is halogen, bisulfate or p-toluene sulfonate in a solvent at a temperature of about 0° to about 200° C. to produce the compound of formula VII.

4,620,010

PROCESS FOR PREPARING CARBOALKOXY SUBSTITUTED BENZOXAZOLE COMPOUNDS

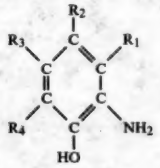
Shou-Nan Ueng, West Haverstraw, and Frederick A. Golec, Jr., Ossining, both of N.Y., assignors to USV Pharmaceutical Corp., Tuckahoe, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,644

Int. Cl.[4] C07D *263/58, 263/60*

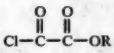
U.S. Cl. 548—217 **7 Claims**

1. A process for preparing a carboalkoxy substituted or unsubstituted benzoxazole compound which comprises reacting an aminophenol compound having the formula I



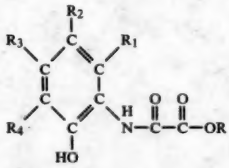
I

with an alkyl oxalyl chloride compound having the formula II



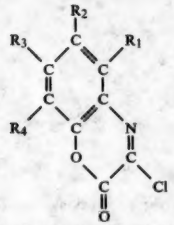
II

to form an oxamide ester having the formula III



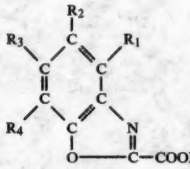
III

cyclochlorinating the oxamide ester III with phosphorus oxychloride to form an imidoyl chloride compound having the formula IV



IV

reacting the imidoyl chloride IV with alkali metal alkoxide the presence of an alcohol to form a benzoxazole product having the formula V



V

wherein

R is a C_1–C_6 alkyl group with a straight or branched chain;

X is selected from the group consisting of an alkyl group of 1 to 6 carbon atoms and an alkoxy alkyl group of 1 to 6 carbon atoms,

each R_1, R_2, R_3 and R_4 is independently hydrogen, phenyl, cycloalkyl of 3 to 5 carbon atoms alkyl of 1 to 5 carbon atoms, or may with adjacent R substitution form an alkylene bridge having 3 or 4 carbon atoms, with the proviso that when there is an alkylene bridge the remaining R substitutions are independently hydrogen, cycloalkyl or alkyl.

4,620,011

TRIAZOLYL ETHANOL DERIVATIVES

Paul A. Worthington, and Margaret C. Shephard, both of Maidenhead, England, assignors to Imperial Chemical Industries PLC, London, England

Continuation of Ser. No. 745,780, Nov. 29, 1976. This application May 24, 1984, Ser. No. 613,404

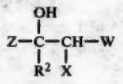
Claims priority, application United Kingdom, Dec. 3, 1975, 49656/75; Nov. 16, 1976, 47666/76

The portion of the term of this patent subsequent to Sep. 18, 2001, has been disclaimed.

Int. Cl.[4] C07D *249/08*

U.S. Cl. 548—262 **2 Claims**

1. A compound of the formula



wherein

X is hydrogen, butyl, benzyl, halobenzyl or phenylbenzyl;

Z is an unsubstituted phenyl group or a phenyl group substituted with up to three substituents selected from the group consisting of halogen, nitro, lower alkyl or lower alkoxy;

R^2 is C_1–C_8 alkyl, alkenyl or alkynyl of up to 8 carbons, unsubstituted phenyl or phenyl substituted with up to two substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl and methoxy, or unsubstituted benzyl or benzyl substituted by substituents selected from the group consisting of halogen, nitro, trifluoromethyl, cyano, methyl or methoxy; and

W is a 1-(1,2,4-triazole); and the agronomically acceptable acid addition salts and metal complexes thereof.

4,620,012

SPIROCYCLIC AMINOACID DERIVATIVES, PROCESSES FOR THEIR PREPARATION, AGENTS CONTAINING THEM AND THEIR USE AND NEW SPIROCYCLIC AMINOACIDS AS INTERMEDIATES AND PROCESSES FOR THEIR PREPARATION

Rainer Henning, Frankfurt am Main; Hansjörg Urbach, Kronberg; Volker Teetz, Hofheim am Taunus, and Reinhard Becker, Wiesbaden, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Fed. Rep. of Germany

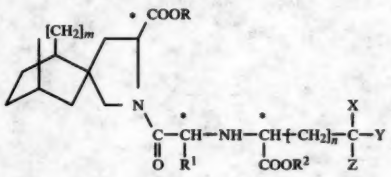
Filed Jan. 10, 1984, Ser. No. 569,758

Claims priority, application Fed. Rep. of Germany, Jan. 12, 1983, 3300774

Int. Cl.[4] C07C *103/52;* **A61K** *37/02*

U.S. Cl. 548—411 **8 Claims**

1. A compound of the formula I



in which

m denotes 1 or 2,

n denotes 0 or 1,

R denotes hydrogen, (C_1 to C_6)-alkyl or aralkyl having 7 to 9 carbon atoms,

R^1 denotes hydrogen or (C_1 to C_6)-alkyl which can optionally be substituted by amino, (C_1 to C_6)-acylamino or benzoylamino, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_5 to C_6)-cycloalkenyl, (C_5 to C_7)-cycloalkyl-(C_1 to C_4)-alkyl, (C_6 to C_{12})-aryl or partially hydrogenated (C_6 to C_{12})-aryl, each of which can be substituted by (C_1 to C_4)-alkyl, (C_1 or C_2)-alkoxy or halogen, (C_6 to C_{12})-aryl-(C_1 to C_4)-alkyl or (C_7 to C_{13})-aroyl-(C_1 to C_2)-alkyl, both of which can be substituted in the aryl radical as defined above, a monocyclic or bicyclic heterocyclic radical having 5 to 7 or 8 to 10 ring atoms respectively, 1 to 2 ring atoms being sulfur or oxygen atoms and/or 1 to 4 ring atoms being nitrogen atoms, or an optionally protected side chain of a naturally occurring α-aminoacid,

R^2 denotes hydrogen, (C1 to C6)-alkyl, (C2 to C6)-alkenyl or (C_6 to C_{12})-aryl-(C_1 to C_4)-alkyl,

Y denotes hydrogen or hydroxyl,

Z denotes hydrogen or

Y and Z together denote oxygen and

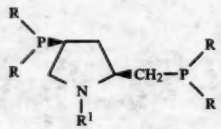
X denotes (C_1 to C_6)-alkyl, (C_2 to C_6)-alkenyl, (C_5 to C_9)-cycloalkyl, (C_6 to C_{12})-aryl which can be monosubstituted, disubstituted or trisubstituted by (C_1 to C_4)-alkyl, (C_1 to C_4)-alkoxy, hydroxy, halogen, nitro, amino, (C_1 to C_4)-alkylamino, di-(C_1–C_4)-alkylamino and/or methylene-dioxy, or 3-indolyl, and its physiologically acceptable salts.

4,620,013
CHIRAL PHOSPHINES

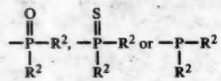
Emil A. Broger, Magden, and Yvo Crameri, Oberwil, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 458,418, Jan. 17, 1983, Pat. No. 4,539,411. This application Jun. 14, 1985, Ser. No. 744,584
Claims priority, application Switzerland, Feb. 5, 1982, 711/82; Dec. 8, 1982, 7010/82
Int. Cl.[4] C07F *9/65, 15/00*
U.S. Cl. 548—412 8 Claims

1. Chiral phosphines of the formula



wherein R represents aryl and R^1 represents a group of the formula

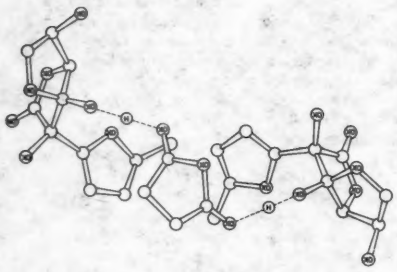


in which R^2 represents aryl, di(lower alkyl)amino, hydroxy, aryloxy or lower alkoxy.

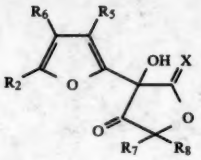
4,620,014
2-FURYLBUTYROLACTONES AND METHODS FOR USING SAME

Albert Szent-Gyorgyi, Woods Hole, Mass., and Gabor B. Fodor, Morgantown, W. Va., assignors to National Foundation for Cancer Research, Bethesda, Md.

Continuation-in-part of Ser. No. 450,493, Dec. 16, 1982, abandoned, which is a continuation of Ser. No. 192,806, Oct. 1, 1980, abandoned, which is a division of Ser. No. 93,594, Nov. 13, 1979, Pat. No. 4,287,205, which is a continuation of Ser. No. 917,327, Jun. 20, 1978, abandoned. This application Sep. 29, 1983, Ser. No. 536,994
Int. Cl.[4] C07D *207/40, 307/00, 307/34*
U.S. Cl. 548—545 5 Claims



1. A compound of the formula

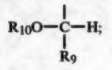


wherein:

R_2 is selected from the group consisting of hydrogen and lower alkyl;

R_5 and R_6 are selected from the group consisting of hydrogen and lower alkyl and may be the same or different; R_8 is selected from the group consisting of hydrogen and lower alkyl;

R_7 is hydrogen, lower alkyl or



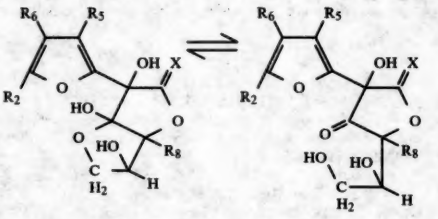
R_9 is CH_2OH

R_{10} is hydrogen; consisting of hydrogen, lower alkyl, phenyl and hydroxyl substituted loweralkyl and may be the same or different;

when R_7 contains a hydroxyl group in the α or β position, R_7 may form the hemiketal ring closure at the carbon 3 of the butyrolactone with protonation of the carbonyl group on the same carbon atom; and

X is selected from the group consisting of O, S, and NH.

2. The compound of claim 1 having the structure formula



wherein:

R_2 is $-CH_3$;

R_5 and R_6 are each hydrogen;

X is O;

R_8 is as defined in claim 1.

3. A crystalline molecular complex, comprising the compound of claim 2 and succinic anhydride in a molar ratio of 2:1.

4. A crystalline molecular complex, comprising the compound of claim 2 and succinimide in a molar ratio of 2:1.

4,620,015
SYNTHESIS OF β-((2-METHYLPROPOXY)METHYL)-N-PHENYL-N-(PHENYLMETHYL)-1-PYRROLIDINEETHANAMINE

Frank J. Stiefel, Princeton Junction, N.J., assignor to Carter-Wallace, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 334,535, Dec. 28, 1981, abandoned. This application Aug. 10, 1983, Ser. No. 521,895
Int. Cl.[4] C07D *207/08*
U.S. Cl. 548—547 2 Claims

1. A process for preparing the n-propanoldiamine ether, β-[(2-methypropoxy)methyl]-N-phenyl-N-(phenylmethyl)-1-

pyrrolidineethanamine and its hydrochloride salts consisting essentially of the following steps:

(a) reacting isobutanol with epichlorohydrin at elevated temperature in the presence of a Lewis acid;

(b) cooling the reaction mixture of step (a) and combining the mixture with pyrrolidine and dilute sodium hydroxide, extracting the mixture with a petroleum solvent, and distilling the product;

(c) combining the product of step (b) with thionyl chloride dissolved in a petroleum solvent and heating the mixture to reflux;

(d) decomposing the reaction mixture of step (c) with water, rendering the decomposed mixture alkaline, separating the oily layer from the acqueous layer, extracting the acqueous layer with petroleum solvent, combining and washing the oily layer and extract and distilling at elevated temperatures and reduced pressure;

(e) condensing the concentrate of step (d) with n-benzylaniline utilizing sodium hydride dispersed in a solution of xylene and mineral oil as a condensing agent and recovering the desired N-propaneoldiamine ether as its hydrochloride salt.

4,620,016

PREPARATION OF BUTYROLACTONE BY CATALYTIC HYDROGENATION OF SUCCINIC ANHYDRIDE

Charles A. Drake, and Marvin M. Johnson, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1985, Ser. No. 734,506
Int. Cl.[4] C07D *307/32*
U.S. Cl. 549—325 **13 Claims**

1. A process for preparing gamma-butyrolactone comprising the step of contacting a succinic anhydride containing feed stream with a free hydrogen containing gas, in the presence of a catalyst composition selective for the production of gamma-butyrolactone consisting essentially of

(a) substantially metallic nickel, and

(b) aluminum phosphate as support, under such conditions as will result in gamma-butyrolactone reaction product.

4,620,017

CATALYTIC HYDROGENATION OF SUCCINIC ANHYDRIDE TO BUTYROLACTONE

Charles A. Drake, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 16, 1985, Ser. No. 734,510
Int. Cl.[4] C07D *307/32*
U.S. Cl. 549—325 **14 Claims**

1. A process for preparing gamma-butyrolactone comprising the step of contacting a succinic anhydride containing feed stream with a free hydrogen containing gas, in the presence of a catalyst composition selective for the production of gamma-butyrolactone consisting essentially of

(a) substantially metallic nickel,

(b) at least one oxide of cerium, and

(c) a silica-containing support, under such reaction conditions as will result in gamma-butyrolactone reaction product.

4,620,018

BENZO-FUSED, TETRACHLORINATED HETEROCYCLIC COMPOUNDS AND A PROCESS FOR THEIR PREPARATION

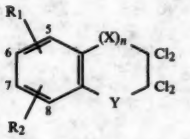
Albrecht Marhold, Leverkusen, and Erich Klauke, Odenthal, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Division of Ser. No. 638,911, Aug. 8, 1984. This application Jun. 26, 1985, Ser. No. 749,151

Claims priority, application Fed. Rep. of Germany, Aug. 11, 1983, 3329126

Int. Cl.[4] C07D *319/14, 307/78*
U.S. Cl. 549—362 **7 Claims**

1. Process for the preparation of compounds of the formula



in which

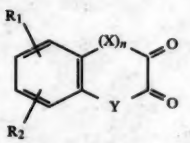
R_1 and R_2 independently of one another represent hydrogen, fluorine, chlorine, bromine, COCl, CO_2CH_3, cyanide, alkyl, nitro, SO_2Cl, SO_2F, OCF_3, SCF_3, CF_3, CCl_3, CBr_3, phenyl, substituted phenyl, $OPOCl_2$, O-alkyl, O-aryl, S-alkyl or S-aryl or,

R_1 and R_2 together represent

X and Y independently of one another represent oxygen or sulphur and

n represents zero or 1,

wherein compounds of the formula



in which R_1, R_2, X, Y and n have the above-mentioned meaning, are reacted with at least 2 moles of phosphorus pentachloride at elevated temperature.

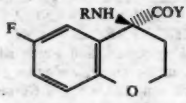
4,620,019

S-6-FLUORO-4-AMINOCHROMAN-4-CARBOXYLIC ACID DERIVATIVES USEFUL AS INTERMEDIATES FOR SORBINIL

Berkeley W. Cue, Jr., Gales Ferry, and Bernard S. Moore, Waterford, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed Aug. 23, 1984, Ser. No. 643,895
Int. Cl.[4] C07D *311/68*
U.S. Cl. 549—404 **6 Claims**

1. A chiral compound of the formula



wherein R is hydrogen or benzyloxycarbonyl and Y is hydroxy or amino, a cationic salt thereof when Y is hydroxy or an acid addition salt thereof when R is hydrogen.

4,620,020

BIS-PHOSPHONIUM SALTS AND PROCESS FOR MAKING THEM

Hubert Schmidbaur, Garching; Cornelia Dörzbach, Munich, both of Fed. Rep. of Germany, and Graham Bowmaker, Auckland, New Zealand, assignors to Hoecht Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

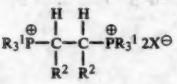
Filed Apr. 4, 1985, Ser. No. 719,590

Claims priority, application Fed. Rep. of Germany, Apr. 21, 1984, 3415037

Int. Cl.⁴ C07F *9/54*

U.S. Cl. 556—18 **9 Claims**

1. Bis-phosphonium salts of the general formula



in which

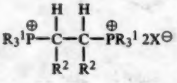
R^1 is a member selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl and butyl,

R^2 is a member selected from the group consisting of methyl, ethyl, n-propyl and iso-propyl, and

$X^{\ominus}$ is a member selected from the group consisting of a halide, dihalogenocuprate(I), tetraphenylborate, tetrafluoroborate and hexafluorophosphate, or

$2X^{\ominus}$ stands for a sulfate.

2. A process for making bis-phosphonium salts of the general formula



in which

R^1 is a member selected from the group consisting of methyl, ethyl, n-propyl, iso-propyl, butyl, a cycloalkyl having from 5–8 carbon atoms, and phenyl,

R^2 is a member selected from the group consisting of a hydrogen radical, methyl, ethyl, n-propyl and iso-propyl, and

$X^{\ominus}$ is a member selected from the group consisting of a halide, tetraphenylborate, tetrafluoroborate and hexafluorphosphate, or

$2X^{\ominus}$ stands for a sulfate,

R^1 standing for a group other than a cycloalkyl or phenyl group in the event of R^2 standing for a radical other than a hydrogen radical,

which comprises: reacting a triorganylphosphonium alkylide of the general formula $R_3{}^1P{=}CHR^2$ with an anhydrous copper (II)halide, the molar ratio of alkylide: halide being ≦1, in a solvent at temperatures of −78° C.–0° C. with agitation, and separating precipitated bis-phosphonium dihalogenocuprate(I).

4,620,021

ORGANIC NICKEL COMPOUNDS, PRODUCTION AND USE THEREOF AS CATALYSTS IN THE POLYMERIZATION OF OLEFINS

Karl-Heinz A. O. Starzewski, Bad Vilbel; Josef Witte, Cologne, and Herbert Bartl, Odenthal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Sep. 25, 1984, Ser. No. 654,227

Claims priority, application Fed. Rep. of Germany, Oct. 7, 1983, 3336500

Int. Cl.⁴ C07F *15/04*

U.S. Cl. 556—19 **6 Claims**

1. Nickel compounds obtained by reacting a nickel-(O) compound or a nickel compound which may be converted in situ into a nickel-(O) compound with an adduct or a mixture of a quinoid compound and a tertiary phosphine and with a compound corresponding to the following general formula:

(I)

wherein

R^1, R^2 and R^3 independently represent C_1–C_{20} alkyl, C_2–C_{20} alkenyl, C_6–C_{12} aryl or C_3–C_8 cycloalkyl optionally substituted by halogen, hydroxy, C_1–C_{20} alkoxy, nitro or C_6–C_{12} aryloxy; also C_6–C_{12} aryl-C_1–C_{20} alkyl, C_6–C_{12} aryl-C_2–C_{20} alkenyl, C_1–C_{20} alkyl-C_6–C_{12} aryl, C_1–C_{20} alkyl-C_3–C_8 cycloalkyl and C_6–C_{12} aryl-C_3–C_8 cycloalkyl, di-C_1–C_4 alkylamino, optionally substituted phenoxy or alkoxy; R^4, R^5 and R^6 represent hydrogen, silyl, halogen, cyano or R^1 and

X represents O, NR^4 or

4,620,022

PREPARATION OF SUBSTITUTED TRIALKYLSILYLOXYMALONIC ACID DINITRILES

Kurt Findeisen, Odenthal, and Rudolf Fauss, Cologne, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

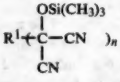
Continuation of Ser. No. 589,621, Mar. 14, 1984, abandoned. This application Jul. 19, 1985, Ser. No. 757,060

Claims priority, application Fed. Rep. of Germany, Mar. 25, 1983, 3310954

Int. Cl.⁴ C07F *7/10*

U.S. Cl. 556—417 **4 Claims**

1. A process for the preparation of a substituted trimethylsilyloxymalonic acid dinitrile of the formula

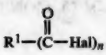


in which

R^1 is phenyl, or phenyl substituted in at least one of m-,m'-, and p-positions by chlorine, fluorine, methyl, methoxy, trifluoromethyl, trifluoromethoxy or, bromine, and

n is an integer from 1 to 4,

which comprises in a first step reacting an acid halide of the formula



in which

Hal is fluorine, chlorine, bromine or iodine, with at least its molar equivalent amount per acid halide substituent of trimethylsilylcyanide of the formula

$(CH_3)_3$ SiCN

at a temperature between 60° and 150° C., removing the by-product trialkylsilylhalide, and reacting the reaction mixture with additional trimethylsilylcyanide in the presence of a base at a temperature between −10° and +60° C.

4,620,023

METHOD FOR PREPARING HEXAMETHYLCYCLOTRISILOXANE AND USES FOR THE SAME

Franz-Heinrich Kreuzer, Martinsried, and Helmut Gebauer, Munich, both of Fed. Rep. of Germany, assignors to Consortium fur Elektrochemische Industrie GmbH, Munich, Fed. Rep. of Germany

Filed Aug. 17, 1983, Ser. No. 524,009

Claims priority, application European Pat. Off., May 27, 1983, 83105271.7

Int. Cl.⁴ C07F *7/08*

U.S. Cl. 556—460 **2 Claims**

1. An improved method for preparing hexamethylcyclotrisiloxane by heating linear, branched, or cross-linked organopolysiloxanes having at least 50 mol percent of dimethylpolysiloxane units to at least 320° C. and simultaneously distilling off the cyclic dimethylpolysiloxanes formed during heating, the improvement which comprises heating the organopolysiloxanes in the absence of acidic and basic compounds which attack the siloxanes group.

4,620,024

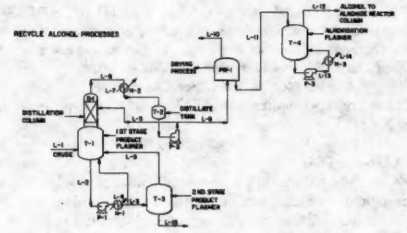
PROCESS FOR PRODUCING AND RECOVERING TRIBUTYL PHOSPHATE ESTERS

Robert I. Davis, Pennington, N.J., and Thomas G. Seador, Tonawanda, N.Y., assignors to FMC Corporation, Philadelphia, Pa.

Continuation-in-part of Ser. No. 491,625, May 5, 1983, abandoned. This application Oct. 22, 1984, Ser. No. 663,275

Int. Cl.⁴ B01D *3/06*; C07F *9/02*

U.S. Cl. 558—113 **3 Claims**



1. In a continuous alkoxidation-phosphorylation process for producing tributyl phosphate having low color utilizing excess butanol in which the continuous alkoxidation reaction is heated by flash distilling the butanol and introducing the overhead from such alkoxidation flash still into the alkoxidation reactor to heat the reaction and drive off water overhead, feeding the alkoxidation reactor bottoms, the alkoxide in excess butanol, to a continuous phosphorylation reactor and after phosphorylation recovering the excess butanol from the phosphorylation reaction mixture by two stage flash distillation, the bottoms tributyl phosphate product from the first stage butanol recovery flash still going to the second stage butanol recovery flash still, the butanol overhead product from the second stage returning to the first stage flash distillation, and the bottoms, tributyl phosphate product, from the second stage distillation going to a final product washing and drying process while the overhead butanol from the first stage flash distillation is fed to the process alkoxidation alcohol flash still, the improvement which comprises distilling in a distillation column the butanol overhead from the first stage flash distillation and then feeding the butanol overhead from the distillation column to the alkoxidation alcohol flash still.

4,620,025

PROCESS FOR THE PREPARATION OF BIPHENYL INTERMEDIATES

Meyer Sletzinger, North Plainfield, and Thomas R. Verhoeven, Cranford, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

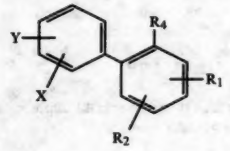
Filed Aug. 1, 1984, Ser. No. 637,081

Int. Cl.⁴ C07C *121/70, 69/533, 43/303*

U.S. Cl. 558—401 **7 Claims**

1. A process for the preparation of a compound represented by the following general Formula (IV)

(IV)



wherein:

R_1 and R_2 independently re:

(1) chloro;

(2) fluoro; or

(3) C_{1-4} alkyl;

R_4 is

(1) —CH=CHCN;

(2) $-CH=CHCO_2R_5$; or

(3) $-CH=CHCH(OR_5)_2$,

in which R_5 is C_{1-4} alkyl; and

X and Y independently are:

(1) hydrogen;

(2) chloro;

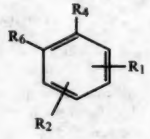
(3) fluoro;

(4) C_{1-4} alkyl; or

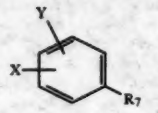
(5) C_{1-4} alkoxy;

which comprises reacting a compound of the Formula (V):

(V)



wherein R_1, R_2 and R_4 are defined above; and R_6 is halogen with a compound of the Formula (VI)

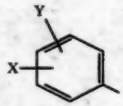


(VI)

wherein X and Y are defined above and R_7 is

(1) ZnR_8;
(2) MgR_8;
(3) CdR_8; or
(4) Li

in which R_8 is halogen or a radical represented by the following formula:



wherein X and Y are defined above, in the presence of a nickel catalyst.

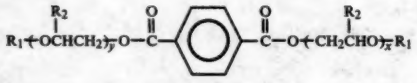
4,620,026

MONOMERIC PLASTICIZERS FOR HALOGEN-CONTAINING RESINS

Sanford A. Siegel, Baton Rouge, La., assignor to The Dow Chemical Company, Midland, Mich.

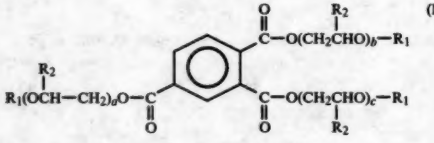
Filed Aug. 10, 1984, Ser. No. 640,072
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—85 **9 Claims**

1. A mixture of at least two diesters of terephthalic acid, said diesters being of the general formula



wherein R_1 is a phenyl radical or an aliphatic hydrocarbon radical of the formula C_nH_m, wherein n is an integer of 1 through 8 inclusive and m is equal to $2n+1$; R_2 is either hydrogen or an aliphatic hydrocarbon radical having one, two, three or four carbon atoms; x is an integer of 2 to 4 inclusive; and y is an integer of 2 to 4 inclusive;

2. A mixture of at least two triesters of trimellitic acid, said triesters being of the general formula



(II)

wherein R_1 is a phenyl radical or an aliphatic hydrocarbon radical of the formula C_nH_m wherein n is an integer of 1 through 8 inclusive and m is equal to $2n+1$; R_2 is either hydrogen or an aliphatic hydrocarbon radical having one, two, three or four carbon atoms; a is 2, 3 or 4; b is 2, 3 or 4; and c is 2, 3 or 4.

4,620,027

CATALYST AND PROCESS FOR PRODUCTION OF CINNAMATES

Chao-Yang Hsu, Media, Pa., assignor to Sun Refining and Marketing Company, Philadelphia, Pa.

Filed Dec. 21, 1984, Ser. No. 684,766
Int. Cl.[4] C07C *69/76*
U.S. Cl. 560—104 **13 Claims**

1. A method for the production of alkyl esters of cinnamic acid comprising the oxidative carbonylation of a styrene compound with carbon monoxide, oxygen, and an aliphatic alcohol in the presence of a catalytic amount of a palladium salt, an alkali metal carboxylate and a copper salt.

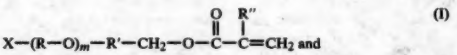
4,620,028

ESTERS OF HYDROXYALKYL ETHERS OF BORNANE

C. Rodney Gorman, Orange Park; James M. Evans, and Sean G. Traynor, both of Jacksonville, all of Fla., assignors to SCM Corporation, New York, N.Y.

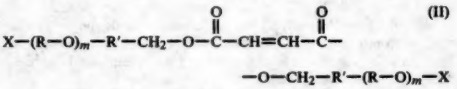
Filed May 28, 1985, Ser. No. 738,230
Int. Cl.[4] C07C *69/74*
U.S. Cl. 560—193 **11 Claims**

1. A compound having a general formula selected from:



(I)

and



(II)

wherein X is [2-(1,7,7-trimethylbicyclo[2.2.1]hept-2-ylo)oxy]1,7,7-trimethylbicyclo[2.2.1]hept-2-yloxy radical, R is $-(CH_2)_p-$ where p varies from 1 to 3; R' is $-(CH_2)_n-$ where n varies from 1 to 7; R" is hydrogen or methyl; and m is 0 to 4.

4,620,029

METHOD FOR MAKING OXALIC ACID DIESTERS

Günter Schroeder, Ober-Ramstadt, and Ehrenfried Baumgartner, Darmstadt, both of Fed. Rep. of Germany, assignors to Röhm GmbH, Darmstadt, Fed. Rep. of Germany

Filed Nov. 5, 1984, Ser. No. 668,193
Claims priority, application Fed. Rep. of Germany, Nov. 23, 1983, 3342291
Int. Cl.[4] C07C *67/36*
U.S. Cl. 560—204 **10 Claims**

1. A method for making a diester of oxalic acid which comprises oxidatively carbonylating an alcohol having 1 to 10 carbon atoms with carbon monoxide and with oxygen at a pressure from 1 to 700 bars and at a temperature from 20° C. to 250° C. in an initally anhydrous reaction phase comprising said alcohol having dissolved therein a catalyst system consisting essentially of, as cations, ions of palladium(II) and of copper in a molar ratio of at least 0.2, together with alkali metal ions, and, as anions, halide ions and carboxylate ions having 1 to 6 carbon atoms, the amounts of all ions in said catalyst system being such that the solution of the cations and anions in the reaction phase a formal pH value, as determined electrisetrically, between 8 and 5.

4,620,030

PREPARATION OF METHYL ISOCYANATE IN A QUARTZ REACTOR

George E. Heinsohn, Elkton, Md., and Velliyur N. M. Rao, Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 23, 1984, Ser. No. 663,847

Int. Cl.[4] C07C *71/00*

U.S. Cl. 560—338 1 Claim

1. In a process for the preparation of methyl isocyanate by the gas-phase reaction of monomethyl formamide with oxygen at 400°–700° C. in the presence of a silver-containing catalyst, the improvement comprising carrying out the reaction in a quartz reactor.

4,620,031

PROCESS FOR PREPARING ALPHA-ARYL-ALKANOIC ACIDS

Fulvio Uggeri, Codogno; Graziano Castaldi, Briona, and Claudio Giordano, Vicenza, all of Italy, assignors to Zambon S.p.A., Vicenza, Italy

Filed Feb. 1, 1985, Ser. No. 697,449

Claims priority, application Italy, Feb. 3, 1984, 19434 A/84

Int. Cl.[4] C07C *63/36*

U.S. Cl. 562—466 5 Claims

1. A process for preparing an alpha-aryl-alkanoic acid comprising heating a mixture of a corresponding alpha-bromo- or chloro-alkyl-aryl-ketone in (a) a saturated straight or branched chain aliphatic diol, or (b) a mixture thereof, said saturated diol having from 2 to 10 carbon atoms, in the presence of a Broensted's acid, and subsequently making the resulting reaction mixture alkaline.

4,620,032

DEPOLYMERIZATION OF CONDENSATION POLYMERS INVOLVING A PRE-MOLECULAR WEIGHT REDUCTION STEP

Marvin L. Doerr, Charlotte, N.C., assignor to Celanese Corporation, New York, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,443

Int. Cl.[4] C07C *51/487, 99/12, 27/26, 85/26*

U.S. Cl. 562—483 25 Claims

1. A process for the depolymerization of a condensation polymer comprising the steps in combination:

(a) intimately admixing molten condensation polymer selected from the group consisting of polyamides and polyesters with a depolymerization agent selected from the group consisting of (i) a product resulting from the complete hydrolytic depolymerization of said condensation polymer in liquid form, and (ii) water, said depolymerization agent being present in said admixture in an amount by weight of less than the weight of said condensation polymer,

(b) admixing said molten condensation polymer and said depolymerization agent for a time sufficient that the molecular weight of said condensation polymer is reduced by at least 50%; and

(c) subjecting said treated condensation polymer to neutral hdryolysis with a substantial excess of water based on the weight of the condensation polymer, to thereby effect substantially complete hydrolytic depolymerization of said condensation polymer.

4,620,033

PROCESS FOR PRODUCING CARBOXYLIC ACIDS

Tomiya Isshiki, Tokyo; Yasuhiko Kijima; Yuh Miyauchi, both of Chiba, and Takao Kondo, Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation of Ser. No. 369,639, Apr. 19, 1982, abandoned. This application Feb. 4, 1985, Ser. No. 697,696

Claims priority, application Japan, Apr. 21, 1981, 56-60418; Jul. 20, 1981, 56-113159

Int. Cl.[4] C07C *51/12, 53/08*

U.S. Cl. 562—519 17 Claims

1. A process for producing a carboxylic acid which comprises reacting a hydrocarbyl alcohol with carbon monoxide in the presence of (A), a catalyst consisting essentially of at least one material selected from the group consisting of nickel, nickel compounds and mixtures thereof, (B) at least one iodide and (C) a promotor characterized in that said promotor consists essentially of:

component (i) composed of one or more compounds selected from the group consisting of stannous iodide, stannous acetate and stannic iodide, and

component (ii) composed of one or more compunds selected from the group consisting of lithium iodide and lithium actate;

wherein the amount of said component (ii) employed is in the range of 10^{-3} to 10 g-atom per 1 liter of the reaction solution in terms of metal and at the same time, it is in the range of 0.01 to 100 g-atom per 1 g-atom of catalyst (A) in terms of metal; said reaction being carried out at a temperature of 80° to 300° C. and at a carbon monoxide partial pressure of 1 to 200 kg/cm^2.

4,620,034

PROCESS FOR THE PREPARATION OF 2-KETO-ALDONIC ACIDS

Peter C. C. Smits, Venlo, Netherlands, assignor to Akzo NV, Arnhem, Netherlands

Filed Jan. 22, 1985, Ser. No. 693,251

Claims priority, application Netherlands, Jan. 23, 1984, 8400203

Int. Cl.[4] C07C *51/235, 51/373, 59/215*

U.S. Cl. 562—531 6 Claims

1. A process for the preparation of a 2-keto-aldonic acid from an aldose or aldonic acid, wherein a liquid aqueous solution of an aldose or aldonic acid having a pH in a range of 4–12 is oxidized with molecular oxygen at a temperature in the range of from 0 to 200° C. in the presence of a platinum catalyst together with a catalytic amount of at least one member selected from the group consisting of lead, bismuth and compounds thereof.

4,620,035

PRODUCTION OF ACRYLIC ACID BY OXIDATION OF ACROLEIN

Richard Krabetz, Kirchheim, and Heinz Engelbach, Limburgerhof, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 88,577, Oct. 26, 1979, abandoned, which is a continuation of Ser. No. 859,327, Dec. 12, 1977, abandoned, which is a continuation of Ser. No. 442,492, Feb. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 11,872, Feb. 16, 1970, Pat. No. 3,845,120. This application Oct. 9, 1981, Ser. No. 310,409

Claims priority, application Fed. Rep. of Germany, Feb. 22, 1969, 1908965

Int. Cl.[4] C07C *51/25, 57/055*

U.S. Cl. 562—534 7 Claims

1. A process for the production of acrylic acid which comprises oxidizing acrolein with a gas containing oxygen in the gas phase at elevated temperature and in the presence of a catalyst which, in addition to oxygen, consists essentially of (a) molybdenum, (b) tungsten, (c) vanadium and at least one mem-

ber (d) selected from the group consisting of iron and copper wherein the atomic ratio of (a):(b):(d) is 1 to 20:0.01 to 10:1 and the atomic ratio of vanadium:molybdenum is 0.2 to 6:6.

4,620,036

DIPHENYLALKANOETHER AND DIPHENYLALKANONE OXIMEETHER DERIVATIVES

Keiichi Ono, 1-5-3-530, Higashiawaji, Higashiyodogawa-ku, Osaka; Hajime Kawakami, 2-14-7, Mefu, Takarazuka, Hyogo, and Junki Katsube, 10-20 Machikaneyama-cho, Toyonaka, Osaka, all of Japan

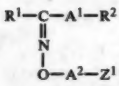
Division of Ser. No. 308,655, Oct. 5, 1981, Pat. No. 4,459,410, which is a continuation-in-part of Ser. No. 136,565, Apr. 2, 1980, Pat. No. 4,388,469. This application Mar. 22, 1984, Ser. No. 592,446

Claims priority, application Japan, Apr. 2, 1979, 54-40032; Aug. 13, 1979, 54-103340

Int. Cl.[4] C07C *131/00*

U.S. Cl. 564—256 **13 Claims**

1. A compound of the formula:



wherein R^1 and R^2 are each independently an aryl group optionally substituted with 1 to 3 substituents selected from the group consisting of halogen, C_1–C_4 alkyl, C_1–C_4 alkoxy, nitro, cyano, di(C_1–C_4)alkylamino, amino, benzyloxy, hydroxyl, C_1–C_4 alkylthio, C_1–C_4 alkylsulfinyl, C_1–C_4 alkylsulfonyl, C_1–C_4 alkanoylamino, C_1–C_4 alkylamino and N-(C_1–C_4)alkyl-N-(C_1–C_4)alkanoylamino; Z^1 is a group of the formula:

wherein R^3 and R^4 are each independently a hydrogen atom, a C_1–C_4 alkyl group or an ar(C_1–C_4)alkyl group or, when taken together with the adjacent nitrogen atom to which they are attached, represent a nitrogen-containing 5 to 7-membered saturated heterocyclic group optionally having an oxygen atom or an additional nitrogen atom as the hetero atom in addition to the said nitrogen atom and, in case of having the additional nitrogen atom, bearing a hydrogen atom, a C_1–C_4 alkyl group, an ar(C_1–C_4)alkyl group or a phenyl group thereon; A^1 is a C_3–C_6 alkylene group; and A^2 is a C_2–C_4 alkylene group, and non-toxic, pharmaceutically acceptable acid addition salts thereof.

4,620,037

SEQUENCED SURFACTANT OLIGOMERS, PROCESS FOR PREPARING THE SAME AND COMPOSITIONS CONTAINING THE SAME

Guy Vanlerberghe, Claye-Souilly, and Henri Sebag, Paris, both of France, assignors to L'Oreal, Paris, France

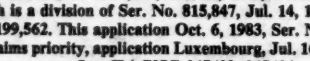
Division of Ser. No. 87,794, Oct. 24, 1979, Pat. No. 4,491,534, which is a division of Ser. No. 815,847, Jul. 14, 1977, Pat. No. 4,199,562. This application Oct. 6, 1983, Ser. No. 539,743

Claims priority, application Luxembourg, Jul. 16, 1976, 75406

Int. Cl.[4] C07C *147/02, 147/14*

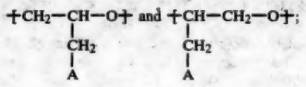
U.S. Cl. 568—36 **10 Claims**

5. A bisequenced oligomer surfactant of the formula

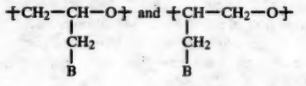


wherein

$[C_2H_3(CH_2A)O]$ represents the two isomers:



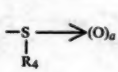
$[C_2H_3(CH_2B)O]$ represents the two isomers:



P represents linear or branched alkyl having 1–20 carbon atoms;

A represents R—CH_2— or R′—O—, wherein R represents linear alkyl having from 4–16 carbon atoms and R′ represents linear or branched alkyl having from 4–20 carbon atoms;

B represents



wherein a represents 0 or 1 and R_4 represents alkyl having 1–3 carbon atoms, hydroxyalkyl having 1–3 carbon atoms or dihydroxyalkyl having 2–3 carbon atoms;

m represents a whole or decimal number from 2 to 10; and n represents a whole or decimal number from 2 to 25.

4,620,038

PROCESS FOR PRODUCING METHYL ETHYL KETONE

Hirotoshi Tanimoto; Mutsuo Yamada; Yoshijiro Arikawa; Taiji Kamiguchi; Yasuyuki Nishimura, and Hiroyuki Kaku, all of Kure, Japan, assignors to Babcock-Hitachi Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 27, 1985, Ser. No. 706,263

Claims priority, application Japan, Feb. 29, 1984, 59-038138

Int. Cl.[4] C07C *45/34*

U.S. Cl. 568—401 **14 Claims**

1. A process for producing a methylethylketone by oxidizing 1-butene in the presence of a metal complex, comprising:

contacting a first metal catalyst MmXn.Ll with oxygen to form an oxygen complex;

contacting a second catalyst M′m′Xn′.L′l′ with 1-butene to form a 1-butene complex; and

contacting the oxygen complex with the 1-butene complex to produce methylethylketone, wherein M represents a transition metal selected from the group consisting of Group I, Groups IV–VII and the iron group of Group VIII of the Periodic Table; X, an anion; L, an organic phosphorous compound selected from the group consisting of phosphorous acid esters, phosphoric acid esters, phyenylphosphinous acid esters, dimethylphosphinic acid esters, triethylphosphine, triphenylphosphine, triphenylphosphine oxide, dimethyl methylphosphonate, methyl dimethylphosphonate and hexamethylphosphoramide; M′, a transition metal selected from the platinum group of Group VIII of the Periodic Table; L′, a ligand selected from the group consisting of at least one of acetonitrile, propionitrile, benzonitrile, tolunitrile, phosphorus acid esters, phosphoric acid esters, phenylphosphinous acid esters, dimethylphosphinic acid ester, triethylphosphine, triphenylphosphine, triphenylphosphine oxide, dimethyl methylphosphonate, methyl dimethylphosphonate, fluorinated toluene, benzotrifluoride, and hexamethylphosphoramide; m, m^1 and n, n^1, each a number determined by the valences of the above transition metals and anions, and

1 and 11, each the number of the ligand and each are an integer in the range of 1 to 4.

4,620,039

NORBORNYLBUTADIENE-ACROLEIN ADDUCTS

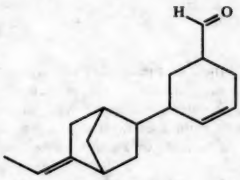
Wilhelmus J. Wiegers, Red Bank, N.J., assignor to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 613,568, May 24, 1984, Pat. No. 4,560,500. This application Jun. 7, 1985, Ser. No. 742,537

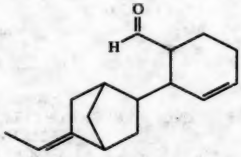
Int. Cl.[4] C07C *47/42*

U.S. Cl. 568—445 **3 Claims**

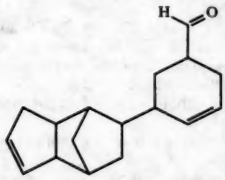
1. The mixture of compounds having the structures:



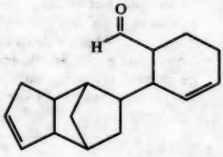
and



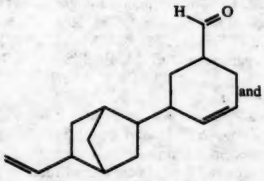
2. The mixture of compounds having the structures:



and

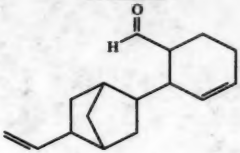


3. The mixture of compounds having the structures:



and

-continued



4,620,040

PROCESS FOR THE PREPARATION OF α-α-α-TRIFLUOROANISOLES

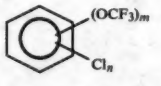
Derek J. Alsop, Buffalo, N.Y., assignor to Occidental Chemical Corporation, Niagara Falls, N.Y.

Filed Mar. 18, 1985, Ser. No. 713,119

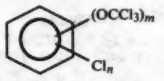
Int. Cl.[4] C07C *41/22*

U.S. Cl. 568—656 **12 Claims**

1. A process for the preparation of a trifluoroanisole compound of the formula



wherein m is 1 or 2 and n is 0 to 3; which comprises reacting hydrogen fluoride with a trichloroanisole compound of the formula



where m and n are as defined above; in the vapor phase in the presence of a fluorinated alumina catalyst.

4,620,041

ETHER CARBINOLS

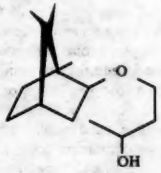
Futoshi Fujioka, Wanamassa; Richard M. Boden, Ocean, and William L. Schreiber, Jackson, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Division of Ser. No. 644,054, Aug. 24, 1984, which is a division of Ser. No. 574,150, Jan. 26, 1984, Pat. No. 4,521,634, which is a continuation-in-part of Ser. No. 533,364, Sep. 19, 1983, Pat. No. 4,532,364, which is a continuation-in-part of Ser. No. 507,292, Aug. 1, 1983, abandoned. This application Oct. 4, 1985, Ser. No. 784,618

Int. Cl.[4] C07C *43/196*

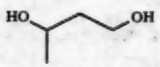
U.S. Cl. 568—665 **2 Claims**

1. An ether carbinol composition comprising the compound having the structure:

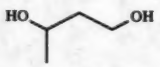


produced according to the process of reacting camphene having the structure:

and 1,3-butane diol having the structure:



in the presence of a Lewis acid catalyst at a temperature in the range of from about 60° C. up to about 100° C.; at a pressure in the range of from about one atmosphere up to about ten atmospheres; the time of reaction being from about two hours up to about twenty hours; the mole ratio of 1,3-dihydroxybutane having the structure:



to camphene varying from about 1:2 up to about 3:1 and then recovering the resulting product by means of fractional distillation.

4,620,042

PREPARATION OF 2-CHLORO-4-FLUOROPHENOL FROM 4-FLUOROPHENOL

Toshikazu Kawai, Kawagoe; Ysunobu Nishimura, and Katumi Kanesaki, both of Kamifukuoka, all of Japan, assignors to Central Glass Company, Limited, Ube, Japan

Filed Mar. 7, 1985, Ser. No. 709,435
Claims priority, application Japan, Mar. 13, 1984, 59-46607
Int. Cl.⁴ C07C *39/27*
U.S. Cl. 568—775 **6 Claims**

1. A method of preparing 2-chloro-4-fluorophenol, comprising the step of making react chlorine gas with 4-fluorophenol at a temperature in the range from about 0° C. to about 185° C. in the absence of catalyst and substantially in the absence of metal ions.

4,620,043

PRODUCTION OF PHENOLS AND CATALYST THEREFOR

Chiu T. Lam, Sewell, N.J., and David M. Shannon, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 379,229, May 17, 1982, Pat. No. 4,567,157. This application Oct. 17, 1985, Ser. No. 788,276
Int. Cl.⁴ C07C *37/00*
U.S. Cl. 568—801 **20 Claims**

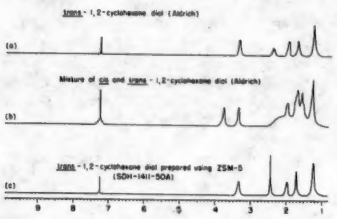
1. A process for catalytically oxidizing an aromatic carboxylic acid having at least one carboxylic group substituted on the aromatic nucleus to the corresponding phenol comprising vapor phase oxidizing with molecular oxygen, in the presence of steam as a diluent, the aromatic carboxylic acid to the corresponding phenol in the presence of a catalytically effective amount of a multicomponent catalyst containing copper, phosphorus present in the form of phosphate, and a metal selected from the group consisting of vanadium, chromium, manganese, iron, cobalt, nickel and zinc, under conditions sufficient to prepare the corresponding phenol.

4,620,044

HYDROLYSIS OF OLEFIN OXIDES TO GLYCOLS

Clarence D. Chang, Princeton, and Stuart D. Hellring, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 16, 1985, Ser. No. 787,931
Int. Cl.⁴ C07C *35/14*
U.S. Cl. 568—833 **18 Claims**



1. A process for making 1,2-diols by the catalytic hydrolysis of an olefin oxide or a cyclo-olefin oxide, in the presence of water, comprising contacting the olefin oxide or a cyclo-olefin oxide of 2 to 20 carbon atoms with a catalyst comprising a silicate or zeolite, wherein said silicate or zeolite, has a constraint index of about 1 to about 12,

wherein said silicate or zeolite has an alpha value ranging from 1 to 500; and

wherein the silicate or zeolite contains acidic hydrogen atoms.

4,620,045

ENEYNOLS FROM ACETYLENES AND PROPARGYLIC ALCOHOLS

Giffin D. Jones, and Harold E. Doorenbos, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 19, 1985, Ser. No. 713,511
Int. Cl.⁴ C07C *29/32, 33/042*
U.S. Cl. 568—873 **30 Claims**

1. A process to prepare eneynols comprising contacting a terminal acetylene with a propargylic alcohol in the presence of a catalyst comprising a metallic halide of Cu^+, Ag^+, Au^+ or combination thereof under conditions such that an eneynol is produced, wherein

the terminal acetylene is a hydrocarbon which contains at least one ethynyl group;

the propargylic alcohol is a hydroxyl-substituted hydrocarbon which contains at least one ethynyl group and contains at least one propargylic carbon, said propargylic carbon to which at least one ethynyl group and at least on hydroxyl group are directly bonded, and

the eneynol is a compound with at least one eneynolic bond between remnants of the terminal acetylene and the propargylic alcohol.

4,620,046

NITRATED ARYL ETHERS

Rainer Hagel, Lichtenfels, and Klaus Redecker, Nuremberg, both of Fed. Rep. of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Fed. Rep. of Germany

Continuation of Ser. No. 477,424, Mar. 21, 1983, abandoned. This application Jun. 24, 1985, Ser. No. 748,027
Int. Cl.⁴ C07C *79/10*
U.S. Cl. 568—930 **2 Claims**

1. A nucleus-nitrated aryl ether which has a decomposition temperature above 200° C. and which has the formula Ar'-O-Ar''-O-Ar' wherein Ar' represents a phenyl radical substituted by 3 nitro groups and free of other substituents; and Ar'' represents a non-substituted phenylene radical.

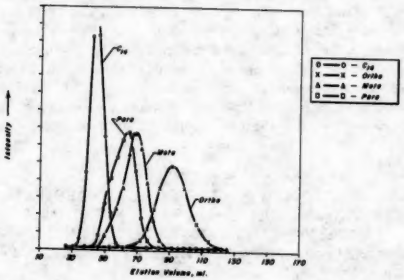
2. A nucleus-nitrated aryl ether which has a decomposition temperature above 200° C. and which has the recurring unit —Ar'-O-Ar''-O—$_n$ wherein Ar' represents a phenylene radical substituted by 1 to 3 nitro groups and free of other substituents and Ar'' represents a non-substituted phenylene radical, when Ar' represents a phenylene radical substituted by three nitro groups, or a phenylene radical substituted by 1 to 3 nitro groups, when Ar' represents a phenylene group substituted by less than 3 nitro groups; and wherein n is an integer of from 4 to 20.

4,620,047

PROCESS FOR THE SEPARATION OF ORTHO-NITROTOLUENE

Hermann A. Zinnen, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Oct. 18, 1984, Ser. No. 661,860
Int. Cl.[4] C07C *79/10*
U.S. Cl. 568—939 **5 Claims**



1. A process for separating ortho-nitrotoluene from a feed mixture comprising ortho-nitrotoluene and at least one other isomer of nitrotoluene, which process comprises contacting at adsorption conditions said mixture with an adsorbent comprising a type X zeolite having cations comprising cations of metals in Group IA or Group IIA of the Periodic Table of the Elements at exchangeable cationic sites, selectively adsorbing said ortho-isomer to the substantial exclusion of the remaining isomers, removing the non-adsorbed portion of the feed mixture from contact with the adsorbent, and thereafter recovering high-purity ortho-nitrotoluene by desorption at desorption conditions with a desorbent material comprising nitrobenzene.

4,620,048

HYDROCARBON SOLUTIONS OF MACROMOLECULAR POLYMERS HAVING AN IMPROVED RESISTANCE TO MECHANICAL DEGRADATION

Gary W. Ver Strate, Matawan, N.J.; William W. Graessley, Evanston, Ill., and Edward N. Kresge, Watchung, N.J., assignors to Exxon Research & Engineering Co., Florham Park, N.J.

Continuation of Ser. No. 356,364, Mar. 9, 1982, abandoned, which is a continuation of Ser. No. 179,022, Aug. 18, 1980, abandoned, which is a continuation-in-part of Ser. No. 27,996, Apr. 9, 1974, abandoned. This application Apr. 17, 1984, Ser. No. 601,376
Claims priority, application United Kingdom, Mar. 26, 1980, 8010190
Int. Cl.[4] C10M *1/28*
U.S. Cl. 585—10 **10 Claims**

1. A mineral lubricating oil fluid containing a major amount of mineral lubricating oil and about 0.5 to 10 weight % of a soluble non-linear macromolecular polydisperse polymer as a V.I. improver dissolved in and at a concentration c such that $0.1 \leqq [\eta]c \leqq 5$ where $[\eta]$ is the intrinsic viscosity of said polymer in that fluid, wherein such fluid exhibits enhanced stability to mechanical shear due to the fact that

$$\frac{\overline{M}_z\overline{M}_{z+1}}{\overline{M}_w{}^2}$$

of the polymer is 3 or less and the reduced compliance of the fluid is less than ten times that of a linear monodisperse polymer in the fluid of the same chemical structure, concentration and $\overline{M}_w$ of said polydisperse polymer, and said polydisperse polymer being selected from the class consisting of ethylene containing polymer consisting of 30 to 80 wt. % ethylene and the balance propylene having a degree of crystallinity of less than 25 wt. % and a $\overline{M}_w$ in the range of about 10^4 to 10^7, polybutadiene, polystyrene, poly(alkylated styrene), ester based polymers and alkylene polyethers, wherein said ethylene containing polymer is characterized by the presence of topological nonlinearity as evidenced by long chain branches, flexible rings or loops in the contour of said ethylene containing polymer, and wherein said polybutadiene, polystyrene, poly(alkylated styrene), ester based polymers and alkylene polyethers are each characterized by combs, flexible rings or loops in their contours, and wherein said long chain branches and combs contain 100 or more backbone carbon atoms.

4,620,049

METHOD AND APPARATUS FOR CONTROLLING POLYBUTENE PRODUCTION

Gregory E. Schmidt; Linus K. Leung, both of Naperville; Lawrence J. Beck, Bolingbrook, all of Ill., and David S. Chang, Cincinnati, Ohio, assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 31, 1984, Ser. No. 666,896
Int. Cl.[4] C07C *2/00*
U.S. Cl. 585—501 **11 Claims**

1. A method for controlling the molecular weight of the product output from a polybutene reactor where operating variables in the reactor are controlled, said method comprising the step of injecting moisture into the reactor or into the butene-butene feed being fed into the reactor.

4,620,050

PROCESS FOR THE MANUFACTURE OF ETHYLENE FROM ETHYL ESTERS

Jean-Marie Cognion, Saint Genis Laval, and Pierre Durual, Vernaison, both of France, assignors to ATOCHEM, France

Filed Sep. 3, 1985, Ser. No. 771,981
Claims priority, application France, Sep. 17, 1984, 84 14399
Int. Cl.[4] L07C *1/253*
U.S. Cl. 585—640 **7 Claims**

1. A process for the manufacture of high purity ethylene by the catalytic decomposition in the gaseous phase of an ethyl ester of an aliphatic carboxylic acid comprising carrying out said decomposition at a temperature between about 150° to 300° C. in the presence of a zeolite having a pore diameter of at least 0.6 nm.

4,620,051

DEHYDROGENATION AND CRACKING OF C_3 AND C_4 HYDROCARBONS TO LESS SATURATED HYDROCARBONS

John H. Kolts, Ochelata, and Gary A. Delzer, Bartlesville, both of Okla., assignors to Philips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1985, Ser. No. 758,983
Int. Cl.[4] C07C *5/333*
U.S. Cl. 585—663 **40 Claims**

1. A method for converting feed hydrocarbons comprising

at least one of C_3 and C_4 hydrocarbons to less saturated hydrocarbons, comprising:

(a) establishing a body of cracking catalyst, in a reaction zone, selected from the group consisting essentially of:

(1) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of manganese and the balance of (B) at least one oxide of magnesium;

(2) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony and (B) at least one oxide of manganese and the balance of (C) at least one oxide of magnesium;

(3) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony, (B) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium and (C) at least one oxide of manganese and the balance of (D) at least one oxide of magnesium;

(4) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony, (B) at least one oxide of chromium and (C) at least one oxide of manganese and the balance of (D) at least one oxide of magnesium;

(5) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of at least one element selected from the group consisting of silicon, aluminum and titanium and (B) at least one oxide of manganese and the balance of (C) at least one oxide of magnesium;

(6) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of (A) at least one oxide of chromium and (B) at least one oxide of manganese and the balance of (C) at least one oxide of magnesium;

(7) a catalyst comprising: about 0.1 to 30 wt. % of (A) at least one oxide of manganese and the balance of (B) of at least one metal selected from the group consisting of Lanthanum Series metals and niobium; and

(8) a catalyst comprising: about 0.1 to 30 wt. % of (A) at least one oxide of chromium and (B) at least one oxide of manganese and the balance of (C) at least one oxide of at least one metal selected from the group consisting of Lanthanum Series metals and niobium,

said wt. % being expressed in terms of the element based on the total weight of catalyst,

(b) introducing said feed hydrocarbons into the upstream end of said body of catalyst;

(c) passing the thus introduced feed hydrocarbons through said body of catalyst and in contact therewith;

(d) withdrawing said product hydrocarbons from the downstream end of said body of catalyst; and

(e) maintaining conditions within said body of catalyst sufficient to convert said feed hydrocarbons to said product hydrocarbons, including: a temperature in said upstream end of said body of catalyst between about 400° C. and about 750° C. and a temperature at said downstream end of said body of catalyst between about 100° C. and about 200° C. above said temperature in said upstream end.

4,620,052

DEHYDROGENATION AND CRACKING OF C_3 AND C_4 HYDROCARBONS

John H. Kolts, Ochelata, and Gary A. Delzer, Bartlesville, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jul. 25, 1985, Ser. No. 758,936

Int. Cl.[4] C07C *5/333*

U.S. Cl. 585—663 **30 Claims**

1. A method for converting feed hydrocarbons comprising at least one of C_3 and C_4 hydrocarbons to less saturated hydrocarbons, comprising:

contacting said feed hydrocarbons with a catalyst composition selected from the group consisting of:

(a) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of each of (1) at least one oxide of chromium and (2) at least one oxide of manganese and the balance of (3) at least one oxide of magnesium;

(b) a catalyst, comprising: about 0.1 to 30 wt. % of each of (1) at least one oxide of chromium and (2) at least one oxide of manganese and the balance of (3) at least one oxide of at least one metal selected from the group consisting of Lanthanum Series metals and niobium;

(c) a catalyst, consisting essentially of: about 0.1 to 30 wt. % of each of (1) at least one oxide of chromium, (2) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin, and antimony and (3) at least one oxide of manganese and the balance of (4) at least one oxide of magnesium; and

(d) a catalyst, comprising: about 0.1 to 30 wt. % of each of (1) at least one oxide of chromium, (2) at least one oxide of at least one metal selected from the group consisting of calcium, strontium, barium, tin and antimony and (3) at least one oxide of manganese and the balance of (4) at least one oxide of at least one metal selected from the group consisting of Lanthanum Series metals and niobium,

said wt. % being expressed in terms of the element based on the total weight of the catalyst,

under conditions sufficient to convert said feed hydrocarbons to said less saturated product hydrocarbons.

4,620,053

ZINC ALUMINATE DOUBLE BOND ISOMERIZATION CATALYST AND DOUBLE BOND ISOMERIZATION OF OLEFINS EMPLOYING SAID CATALYST

M. Bruce Welch, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 17, 1985, Ser. No. 745,556

Int. Cl.[4] C07C *5/23*

U.S. Cl. 585—664 **6 Claims**

4. A process for double bond isomerizing an olefinic hydrocarbon feedstock having at least four carbon atoms per molecule, said process comprising:

contacting said olefinic feedstock with an activated catalyst prepared by calcining a composition which essentially consists of zinc aluminate in an oxygen containing atmosphere at a temperature of about 250° C. to about 800° C. for a time of about 1 hour to about 30 hours and then contacting the thus calcined composition with a reducing gas selected from the group consisting of carbon monoxide, nitric oxide, and hydrogen at a temperature of about 400° C. to about 750° C. for a time of about 1 minute to about 30 hours, said activated catalyst contacting said olefinic feedstock under effective isomerization conditions to produce a double bond isomerized olefinic product.

4,620,054

ACID-CATALYZED XYLENE ISOMERIZATION

Clarence D. Chang, Princeton, and Joseph N. Miale, Lawrenceville, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 726,194, Apr. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 555,118, Nov. 25, 1983, Pat. No. 4,550,092, which is a division of Ser. No. 317,037, Nov. 21, 1981, Pat. No. 4,435,516. This application Oct. 15, 1985, Ser. No. 787,182

Int. Cl.[4] C07C *5/27*

U.S. Cl. 585—481 **14 Claims**

1. A process for conducting acid-catalyzed conversion of feedstock comprising xylenes to product comprising xylene isomerization product which comprises contacting said feedstock at conversion conditions sufficient to convert said feedstock to said product with a catalyst comprising a zeolite composition prepared by a method comprising treating a crys-

talline zeolite having an initial silica-to-alumina mole ratio of at least 500 with an ammoniacal solution of an alkali metal aluminate for a period of time ranging from about 20 minutes to about 30 days at a temperature of from about 20° C. to about 50° C. and at a pH of at least 10.

4,620,055

PREPARATION OF STYRENE AND STILBENE COMPOUNDS

Carl M. Lentz, Mt. Carmel; James R. Overton, and David D. Cornell, both of Kingsport, all of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 643,323, Aug. 22, 1984, abandoned. This application Oct. 7, 1985, Ser. No. 785,031

Int. Cl.⁴ C07C *15/40*

U.S. Cl. 585—438 **9 Claims**

1. A process for the preparation of styrene and stilbene compounds which comprises reacting at a temperature of about 25° to 150° C. and a pressure of about 1 to 100 atmospheres an aryl sulfonyl chloride of the formula $ArSO_2Cl$, wherein Ar represents a moiety derived from benzene or toluene, with an olefinic compound of the formula $R\text{-}CH{=}CH_2$, wherein R represents H, an alkyl group having up to about 12 carbon atoms, or a substituted or unsubstituted phenyl group, in the presence of a base having a pKa greater than that of pyridine and a catalyst consisting essentially of palladium in a concentration of about 0.1 to 10 mole percent based on the concentration of said aryl sulfonyl chloride.

4,620,056

METHOD FOR PRODUCING AROMATIC HYDROCARBONS

Isoo Shimizu; Hideki Nomura; Kazumichi Uchida, all of Yokohama, and Hitoshi Mitsuyuki, Kawasaki, all of Japan, assignors to Nippon Petrochemicals Co., Ltd., Tokyo, Japan

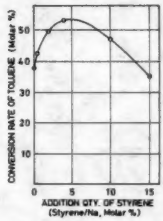
Filed Aug. 28, 1985, Ser. No. 770,506

Claims priority, application Japan, Aug. 29, 1984, 59-179977

Int. Cl.⁴ C07C *2/64*

U.S. Cl. 585—452 **5 Claims**

1. A method for producing an aromatic hydrocarbon which is characterized in that an unsaturated compound having a double bond or bonds that are conjugated with the benzene ring of said unsaturated compound is allowed to coexist in the process to alkylate a substituted aromatic hydrocarbon with ethylene and/or propylene in the presence of 5 mM (millimoles) or more of metallic sodium relative to 1 mole of said substituted aromatic hydrocarbons and at least one member selected from the group consisting of potassium carbonate, potassium hydrogen carbonate and potassium hydroxide which is sufficient to provide 3 mM or more of potassium ions



also relative to 1 mole of said substituted aromatic hydrocarbon, said substituted aromatic hydrocarbon having at least one alkyl group or alkylene group which has at least one hydrogen atom in the α-position relative to the aromatic ring of said substituted aromatic hydrocarbon.

4,620,057

METHANE CONVERSION

James B. Kimble, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jun. 7, 1985, Ser. No. 742,339

Int. Cl.⁴ C07C *2/00*

U.S. Cl. 585—500 **20 Claims**

1. A method for the oxidative conversion of methane to higher hydrocarbons, comprising:

contacting a feed material comprising methane with a solid contact material, comprising:

cobalt; at least one metal selected from the group consisting of zirconium, zinc, niobium, indium, lead and bismuth; phosphorous; at least one Group IA metal; and oxygen, under oxidative conversion conditions sufficient to convert said methane to said higher hydrocarbons.

4,620,058

SEMICONDUCTOR DEVICE FOR CONVERTING LIGHT INTO ELECTRIC ENERGY

Gerhard Winterling, Ottobrunn, and Max Königer, Pullach, both of Fed. Rep. of Germany, assignors to Messerschmitt-Bolkow-Blohm, Fed. Rep. of Germany

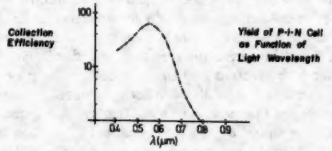
Filed Sep. 19, 1980, Ser. No. 188,725

Claims priority, application Fed. Rep. of Germany, Sep. 21, 1979, 2938260

The portion of the term of this patent subsequent to Oct. 28, 1999, has been disclaimed.

Int. Cl.⁴ H01L *31/06*

U.S. Cl. 136—258 **7 Claims**



1. A semiconductor device for the conversion of incident solar radiation into electrical energy, comprising an amorphous silicon body having a surface to be exposed to the incident radiation, and a cover layer or doped semiconductor material which is arranged on the surface of the amorphous silicon body to be exposed to incident radiation, the amorphous silicon body being one of relatively slightly doped, oppositely doped, or intrinsic amorphous silicon adjacent its surface to be exposed and forming with the cover layer, a heterotransition zone, the cover layer consisting of a polycrystalline silicon layer obtained by deposition from a gaseous phase comprising a silicon containing gas and having a thickness of 0.15 micron at most and an average grain size parallel to the surface which is larger than said thickness by a factor of about two, resulting directly from the deposition process, whereby even the blue-violet part of solar radiation is absorbed by the amorphous silicon body adjacent its incident surface, thereby increasing the efficiency of conversion of the solar radiation into electrical energy.

4,620,059

CABLE VIBRATION DAMPENER AND METHOD OF INSTALLING

Thomas E. Sherman, Chagrin Falls, Ohio, assignor to Preformed Line Products Company, Cleveland, Ohio

Filed Dec. 3, 1985, Ser. No. 804,267

Int. Cl.⁴ H02G *7/14*

U.S. Cl. 174—42 **12 Claims**

1. A device for dampening wind induced vibrations in aerial cables comprising: an elongated rod having a generally straight midsection terminating in helically configured cable gripping sections sized so as to tightly grip the aerial cable on which the device is to be used, and a support helix associated with at least one of said gripping sections, said support helix comprising at least one complete spiral with an open inner diameter greater than the inner diameter of the helically configured gripping sections and at least approximately as great as the diameter of the cable on which the device is to be used.

8. A method of installing on aerial cables a vibration dampener of the type comprising an elongated rod with a generally straight midsection terminating at first and second ends in cable gripping helical sections and having at least one non-gripping support helix adjacent the first end, said method comprising the steps of:

(a) at a first location adjacent the cable, wrapping said support helix about the cable;

(b) while remaining generally at said first location, sliding said rod along said cable to bring said second end generally to the first location;

(c) wrapping the cable gripping helical portion at the second end into gripping relationship with said cable;

(d) wrapping the straight midsection of the rod around said cable and; thereafter,

(e) applying the cable gripping helical portion at the first end to said cable.

4,620,060

ADJUSTABLE VIBRATION DAMPER FOR STRETCHED SUSPENDED CABLES

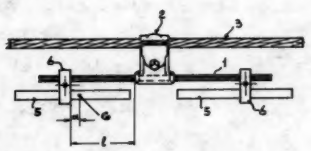
Alberto Perinetti, Milan, Italy, assignor to A. Salvi & C. S.p.A., Milan, Italy

Filed Mar. 22, 1985, Ser. No. 714,918

Claims priority, application Italy, Mar. 22, 1984, 20184 A/84

Int. Cl.⁴ H02G *7/14*

U.S. Cl. 174—42 **15 Claims**



1. Vibration damper for stretched suspended cables or conductors, comprising a messenger cable, two counterweights, a connection element adjustably connecting each counterweight to said messenger cable and said messenger cable to said counterweight and a connection clamp connected to said messenger cable between said counterweights, each said counterweight being formed of at least one bar element of constant section.

4,620,061

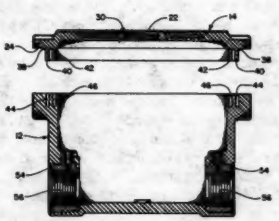
FULLY GROUNDED, CORROSION RESISTANT ELECTRICAL ENCLOSURE

Arthur I. Appleton, Miami Beach, Fla., assignor to Appleton Electric Co., Chicago, Ill.

Filed Sep. 10, 1984, Ser. No. 649,214

Int. Cl.⁴ H02G *3/14*

U.S. Cl. 174—51 **2 Claims**



1. A fully grounded electrical enclosure, comprising:

a molded plastic box portion and a cover portion therefor, said box portion being constructed primarily of plastic and having molded essentially entirely therein a metallic box insert, said box insert including a plurality of tapped seats

to which said cover is fastened, said insert also including at least one hub;

means forming a part of said box insert and electrically interconnecting all of said plurality of seats;

said cover portion also being constructed primarily of plastic and carrying a metallic cover insert contained essentially entirely therein, said cover insert including a plurality of holes therethrough exposed to either side of said cover portion and arranged to each receive a fastener attaching said cover portion into said seats in said box insert and increasing the electrical connection pressure between said cover insert and said seats, said cover insert also including at least one other hole therethrough for mounting an electrical device thereon such as a switch;

said enclosure exposing a minimum of metal to the surrounding atmosphere both outside and within the enclosure whereupon corrosion of the inserts is minimized.

4,620,062

DEVICE FOR FORMING SIGNALS WHICH ARE CHARACTERISTIC OF THE POSITION OF A POINT DETERMINED ON A SURFACE

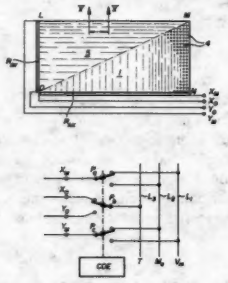
Francois Mizzi, La Celle St Cloud, and Jean-Louis Bellon, Paris, both of France, assignors to RDI Limited Partnership, Wilmington, Del.

Filed Oct. 10, 1984, Ser. No. 659,526

Claims priority, application Switzerland, Oct. 11, 1983, 5563/83

Int. Cl.[4] G08C *21/00*

U.S. Cl. 178—18 **16 Claims**



1. Device for forming signals which are characteristic of the position of a point determined on a surface, especially by pressure exerted at right angles to this point, comprising a first insulating substrate (1) covering the surface, a first grid of conductive tracks (2) placed on one face of this first substrate and spaced apart from each other, a second substrate (5) of flexible insulating material, covering the face of the first substrate carrying the said conductive tracks (2), a second grid of conductive tracks (6) placed on the face of the second substrate located opposite to the first grid of tracks (2), the tracks of this second grid being spaced apart from each other and extending transversely with respect to the tracks of the first grid, elements (4) maintaining the second substrate in a firm position so that each track of its grid remains distant from any of the tracks of the first grid as long as no pressure is exerted on at least one zone of the said second substrate, means for locating the tracks of the said grids brought into mutual contact when the said second substrate is subjected to the said pressure, wherein these means comprise:

two resistive voltage dividers (R_{AX}, R_{AY}), one of which (R_{AX}) is associated with the first of the two grids of tracks and the other (R_{AY}) is associated with the second of these grids, each track of one grid being attached at one end to one point of the respective divider in such a manner that the ohmic resistance between this point and one of the ends of this divider is characteristic of the position occupied by this track in its grid,

first and a second switching elements (P_a, P_c) respectively associated with the first and second voltage dividers and permitting one of the ends of the corresponding divider to be connected either to a reference voltage (V_m) in a first active switching state of each element, or to a voltage signal collection means (L_2, M_e), in a second active state of each element,

a third switching element (P_b) permitting the other end of one or the other divider to be connected to ground (T) or to be disconnected from it,

elements (CDE) for periodically controlling the said switching elements (P_a, P_b, P_c), arranged in such a manner that each of the said first (P_a) and second (P_c) switching elements is set to the first of these two active states when the other of these elements is in the second of these states, and conversely, and in such a manner that said third element (P_b) connects the second end of each divider to ground (T) when the first end of the divider is connected to the said reference voltage sources (V_m), this ground connection being interrupted by this third element (P_b) when the first end of the divider is connected to said voltage signal collection means (L_2, M_e),

the whole being arranged in such a manner that, following a pressure exerted on any point of the said surface corresponding to a zone of electric contact between at least two tracks of which each belongs to a separate grid, the said collection means (L_2, M_e) receives, alternately and in synchronism with the arrival of the said switching elements (P_a, P_b, P_c) in one or the other active states, voltage signals the amplitudes of which are successively characteristic of the abscissa and ordinate of the position of the said tracks and consequently of the said point of the surface.

4,620,063

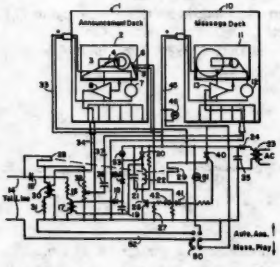
RING SIGNAL DETECTOR

Leonard M. Todd, 424 W. 119th St., New York, N.Y. 10027

Continuation of Ser. No. 959,078, Nov. 9, 1978, abandoned, which is a continuation of Ser. No. 464,626, Apr. 26, 1974, Pat. No. 4,508,466, which is a continuation-in-part of Ser. No. 88,909, Nov. 12, 1970, abandoned. This application Jan. 15, 1984, Ser. No. 691,555

Int. Cl.[4] H04M *1/65*

U.S. Cl. 179—2 A **16 Claims**



1. A ring signal detector for a telephone line in which a ringing voltage appears, having zero d.c. drain from said telephone line for actuating associated apparatus with a direct current produced when said ringing voltage appears comprising a blocking capacitor, a rectifier having an input and an output, R-C delay means having an input and an output, a transistor having a base, an emitter and a collector, a load impedance and a power source, said capacitor and said input of said rectifier connected in series across said telephone line, said output of said rectifier connected to said input of said R-C

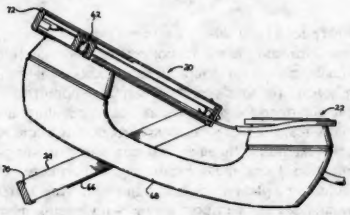
delay means, said output of said R-C delay means connected to said base and said emitter, said load impedance and said collector and said emitter connected in series across said power source, said ringing voltage appearing and being divided into a first voltage across said capacitor and a second voltage across said input of said rectifier, said second voltage being rectified, said rectified voltage being applied from said output of said rectifier to said input of said R-C delay means; after a time delay, said rectified voltage being applied by said output of said R-C delay means to said base and said emitter rising to a level sufficient to cause said transistor to conduct, causing current flow from said power source through said collector and said emitter and said load impedance, said load impedance comprising said associated apparatus, said direct current flow actuating said associated apparatus.

4,620,064

POCKET SIZED TELEPHONE LINE DATA COMMUNICATION SYSTEMS

Bayard F. Kessler, Woodland Hills, and Nell F. Nagy, Ranchos Palos Verdes, both of Calif., assignors to Novation, Inc., Chatsworth, Calif.

Filed Sep. 10, 1984, Ser. No. 648,509
Int. Cl.[4] H04M *11/00*
U.S. Cl. 179—2 C **24 Claims**



1. A device for acoustic coupling to a telephone handset having first and second acoustic devices comprising

a body means having first and second ends and having a first acoustic coupler adjacent said first end thereof, said body means being a means for resting against a part of a handset whereby said first acoustic coupler may acoustically couple with a first acoustic device in a telephone handset

a slide means having a second acoustic coupler adjacent to an outer end thereof, said slide means being slideable with respect to said second end of said body means between a first retracted position whereby said slide means is substantially circumscribed by said body means and a second extended position whereby said second acoustic coupler is substantially spaced from said body means, whereby said slide means may be retracted when not in use, and the position of said slide means may be adjusted when in use so that said first and second couplers may simultaneously acoustically couple with said first and second acoustic devices in a telephone handset, and

means for coupling said device to a telephone handset.

4,620,065

AUTOMATIC TELEPHONE ANSWERING AND RECORDING APPARATUS

Motoichi Hattori, Fujisawa, and Hideyasu Ishigo, Yokohama, both of Japan, assignors to Tokyo Shibaura Denki Kabushiki Kaisha, Kawasaki, Japan

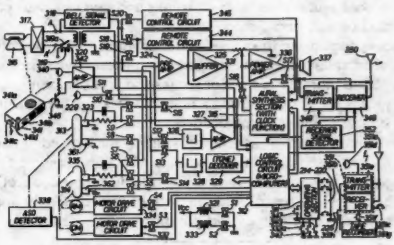
Filed Jul. 29, 1983, Ser. No. 518,487
Claims priority, application Japan, Jul. 30, 1982, 57-133518
Int. Cl.[4] H04M *1/64*
U.S. Cl. 179—6.07 **8 Claims**

1. An automatic telephone answering and recording apparatus for communicating between calling and called subscriber stations connected in a telephone system, comprising:

a speaking circuit provided at a called subscriber station;

first means operating in response to a call signal transmitted by a calling subscriber station over a telephone line to connect the speaking circuit to the calling subscriber station;

second means responsive to the operation of said first means for recording an incoming message transmitted from the calling subscriber station over the telephone line on a first recording medium located at the called subscriber station;



counting means for counting the number of operations of said first means and storing the number so obtained;

third means responsive to said counting means for producing a first aural synthesis output corresponding to the stored number in said counting means and transmitting the first aural synthesis output over the telephone line; and

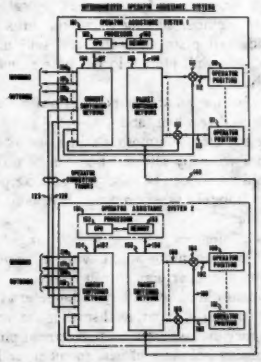
fourth means connected between said speaking circuit and said third means for activating said third means in response to a specific signal transmitted to said speaking system by a subscriber through the telephone line.

4,620,066

METHOD AND APPARATUS FOR SHARING OPERATORS AMONG ASSISTANCE SYSTEMS

William J. Bushnell, St. Charles; Richard W. Hemmeter, Naperville, and Palanichamy Raghavan, Woodridge, all of Ill., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Sep. 27, 1984, Ser. No. 655,693
Int. Cl.[4] H04M *3/60*
U.S. Cl. 179—27 D **27 Claims**



25. An operator assistance system for serving an operator assistance request, and adapted to be connected to a plurality of lines or trunks and to communication means for intercon-

necting said system with other operator assistance systems, comprising:

an operator position;

means for detecting an operator assistance request on one of said plurality of lines or trunks and for generating a first indication if said operator assistance request is to be served by said operator position of said first system and for generating a second indication if said operator assistance request is to be served by an operator position of one of said other operator assistance systems;

means responsive to detection of a request and to said first indication for establishing a connection between said one of said plurality of lines or trunks and said operator position of said first system;

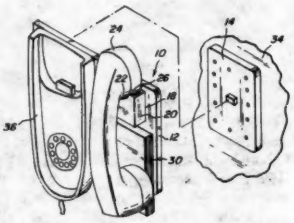
means responsive to said second indication and to detection of a request for establishing a connection between said one of said plurality of lines or trunks and said communication means and for generating a first data message for transmission over said communication means;

said first operator assistance system further comprising means, responsive to second data messages received from said communication means, for establishing a connection between said one of said plurality of lines or trunks and a selected other one of said plurality of lines or trunks.

4,620,067
TELEPHONE WALL CADDY

Philip L. D'Agostino, 1140 Castlegate Dr., Winston-Salem, N.C. 27103

Filed May 10, 1985, Ser. No. 732,557
Int. Cl.[4] H04M *1/06, 1/04;* A47F *7/00*
U.S. Cl. 179—146 R **6 Claims**



1. A telephone wall caddy for a wall telephone having a wall plate and a receiver, said caddy comprises:

(a) a flat base member having a cut out area which fits around said wall plate so that when said telephone is attached to said wall plate said flat base member will be held in position;

(b) a rest box having an arc-shaped cut out which will accommodate said receiver; and

(c) means for adjustably mounting said rest box to said flat base member whereby said rest box can be turned upside down so said caddy can be changed from a right-sided to a left-sided model, wherein said adjustable mounting means includes:

(i) said base member having a mounting hole therethrough, said mounting hole having a longer diameter at rear and a smaller diameter at front;

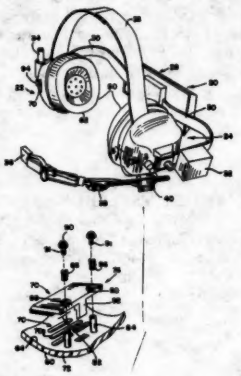
(ii) a placement pin having a larger diameter at rear and a smaller diameter at front, said smaller diameter having an inner aperture, wherein said placement pin fits inside said mounting hole in said base member; and

(iii) a small circular shaped projection on back of said rest box, said projection fits into said inner aperture of said placement pin so that said rest box is adjustable mounted thereto.

4,620,068
COMMUNICATION HEADSET

Klaus Wieder, Helenville, Wis., assignor to Remic Corporation, Elkhart, Ind.

Filed Jun. 6, 1984, Ser. No. 617,694
Int. Cl.[4] H04M *1/05;* H04R *1/10*
U.S. Cl. 179—156 A **8 Claims**



1. An earphone for a wireless communication system, transducer means for said system for converting electrical signals to audio signals, means for coupling said audio signals through said earphone to the user's ear, said earphone comprising a cup adapted to surround the user's ear and having sealing means to substantially seal the user's ear from surrounding audio signals, port means extending through said cup and providing voice communication from the surrounding atmosphere, closure means including a plate inside said cup and having a first position normally sealing said port means with biasing means for moving said plate to said first position, and switch means secured to said plate and extending through said cup for moving said closure means from said first position to another position to allow a user to hear voice communication through said port means, whereby the user may activate said switch to open said port to vent the interior of said earphone housing to adjacent surroundings to more easily receive surrounding audio signals through said port means to the user's ear to enable a user to more easily receive communications from the immediate vicinity.

4,620,069
METHOD AND APPARATUS TO DETERMINE WHETHER A SUBSCRIBER LINE IS LOADED OR NON-LOADED

William R. Godwin, Clemmons, and Salvatore Quattrocchi, Raleigh, both of N.C., assignors to ITT Corporation, New York, N.Y.

Filed Dec. 3, 1984, Ser. No. 677,438
Int. Cl.[4] H04B *3/46*
U.S. Cl. 179—175.3 R **24 Claims**

3. Apparatus to determine whether a telephone subscriber line is loaded or non-loaded comprising

first means to provide a signal having at least one given frequency; second means coupled to said first means to couple said signal to a telephone subscriber line under test having a subscriber subset on-hook;

third means coupled to said subscriber line under test to receive said signal returned from said subscriber line under test; and

fourth means coupled to said third means to analyze said received signal to determine the value of at least one parameter of said subscriber line under test to determine

whether said subscriber line under test is loaded or non-loaded;

wherein said first means includes

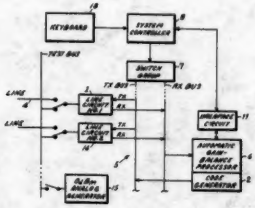
a PROM to store a first digital representation of a sine wave having said given frequency as said signal, and

said second means includes

a digital switching system coupled to said PROM to route said first digital representation to a digital line circuit coupled to said subscriber line under test, and

a digital-to-analog converter disposed in said line circuit to convert said first digital representation to said sine wave for coupling to said subscriber line under test; wherein;

said third means includes



an analog-to-digital converter disposed in said line circuit to convert said sine wave returned from said subscriber line under test to a second digital representation thereof, and second digital representation being routed through said digital switching system to said fourth means and wherein

said fourth means includes

a microprocessor coupled to said digital switching means responsive to said second digital representation to measure the value of the real part of an on-hook impedance of said subscriber line under test and to determine if said measured value is present in a given impedance window indicating a loaded condition of said subscriber line under test.

4,620,070

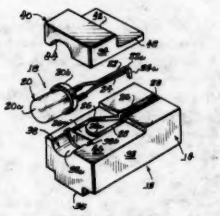
TELEPHONE LINE TESTER

William E. Ruehl, Wheeling, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed Feb. 4, 1985, Ser. No. 698,070

Int. Cl.[4] H04B *3/46*

U.S. Cl. 179—175.3 R **14 Claims**



8. A telephone line tester comprising: a tester body having a connector portion of complementary configuration for insertion into a modular telephone jack; light emitting means mounted to the tester body and having a light body and a pair of elongate leads extending outwardly of said light body; guide means in said tester body for guiding said elongate leads to and across said connector portion to a position for engagement with tip and ring contacts respectively of said modular telephone jack when said connector portion is inserted into said modular telephone jack.

4,620,071

THREE POSITION ELECTRICAL SWITCH

Yuliy Rushansky, Port Washington, N.Y., assignor to Slater Electric Inc., Glen Cove, N.Y.

Filed Dec. 7, 1984, Ser. No. 679,559

Int. Cl.[4] H01H *21/22*

U.S. Cl. 200—6 BA **11 Claims**

1. An improved electrical switch device, for use with electrical loads, having a switch housing with at least two source terminal/contacts therein for termination to an electrical power cable from an electrical power source and first and second load contact/terminals for termination to separate electrical loads, and a generally three-position switch member in the housing, wherein the imporvement comprises a pair of shafts for actuative a pair of movable electrical contact arms, said shafts being unitary with and extending from said switch member, said arms assoicated with two of the terminal/contacts in said housing, said switch member being actuated so as to close both said movable contact arms for energizing all electrcial loads connected to each of the load contact/terminals when said seitch member is in a first, full load, position, and to cause only one of said movable contact arms to be closed for energizing any electrical load connected to only one of said first and second load contact/terminals when said switch member is in a second, partial load, position, and to cause both movable contact arms to be open for de-energizing each eletrcial load connected to either load contact/terminals when said switch member is in a third, fully open, position.

4,620,072

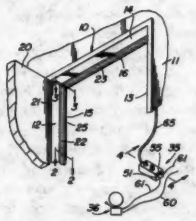
HOLLOW NON-OCCLUDING PRESSURE SENSOR

Norman K. Miller, Concord Industrial Park, Concordville, Pa. 19331

Filed Apr. 12, 1985, Ser. No. 722,607

Int. Cl.[4] H01H *35/34*

U.S. Cl. 200—81 R **8 Claims**



1. A pressure change sensor comprising a flexible hollow body located in position to receive pressure changes to be

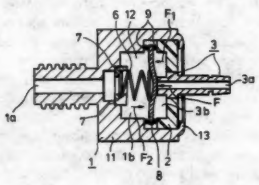
sensed, the ends of the hollow of said body being closed, a fluid operated switch in fluid communication with said hollow for response to pressure changes, and an inner body of a completely solid cross section without any enclosed hollow therein, said inner body being in the hollow of said flexible hollow body, said inner body being of a size less than the hollow of said hollow body and of a shape different from said hollow, to prevent occlusion of said hollow under pressure.

4,620,073

PRESSURE-RESPONSIVE APPARATUS HAVING HYSTERESIS TO PREVENT HUNTING

Mitsuyoshi Yokota, and Akio Matsumoto, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 605,676, Apr. 27, 1984, abandoned. This application Dec. 18, 1985, Ser. No. 815,137
Claims priority, application Japan, Jun. 18, 1983, 58-94015[U]
Int. Cl.[4] H01H *35/34*
U.S. Cl. 200—83 P **5 Claims**



1. A pressure responsive apparatus, comprising:

a case defining an internal volume and having a first fluid port and a second fluid port, said ports each being made of electrically conductive materials but electrically insulated from each other;

a snap-action diaphragm which has a first stable state and a second stable state, with a predetermined force required to cause it to go from each one of said states to the other, mounted nonrigidly in said case and electrically insulated therefrom by flexible peripherally disposed seals on both sides for partitioning said internal volume into a first chamber accessible to fluid via said first fluid port and a second chamber accessible to fluid via said second fluid port, said diaphragm having an electrically conducting portion;

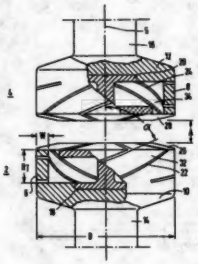
an electrically conducting spring of known stiffness contacting at a first end said electrically conducting first fluid port and contacting at a second end said electrically conducting portion of said diaphragm, said spring then being deflected from its unstressed form by maximum predetermined biasing force on said diaphragm directed towards said second port such that when a predetermined pressure difference between said first and said second chambers is exceeded the combined fluid pressure force and spring bias force causes said diaphragm to move from said first stable state into said second state in which said electrically conducting portion of said diaphragm establishes contact with said electrically conducting second port, such that said first port, said spring, said electrically conducting portion and said second port cooperate to establish an electrically conductive path when said diaphragm is in contact with said second port.

4,620,074

CONTACT ARRANGEMENT FOR VACUUM SWITCHES

Bernt-Joachim Paul, Erlangen, and Roman Renz, Berlin, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany

Filed Feb. 22, 1985, Ser. No. 704,428
Claims priority, application Fed. Rep. of Germany, Feb. 27, 1984, 3407088
Int. Cl.[4] H01H *33/66*
U.S. Cl. 200—144 B **4 Claims**



1. A contact arrangement for a vacuum switch comprising a pair of cup-type contacts, each contact comprising a hollow cylindrical contact carrier for supporting a contact plate having a cup depth H_T, the contacts being arranged coaxially opposite each other and being movable in their axial direction relative to each other, the contact carriers each having a plurality of slots inclined in the same sense with respect to a longitudinal axis of the arrangement, the contact carriers having an outside diameter D, a range for the outside diameter D being 60 mm$\leqq$D $\leqq$150 mm, and wherein the cup depth H_T, the number of slots s and the azimuth B of the slots are determined by the following conditions:

$$0.1\ D \leqq H_T \leqq 0.5\ D \qquad \text{(a)}$$

$$0.03\ D/\text{mm} \leqq s \leqq 0.1\ D/\text{mm} \qquad \text{(c)}$$

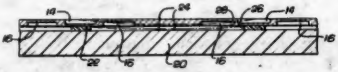
$$\left(8 + 0.1\ D/\text{mm} + 3\,\frac{D/\text{mm}}{s}\right)^{\circ} \leqq B \leqq (150 + 0.5\ D/\text{mm})^{\circ}$$

4,620,075

UNITIZED CONTROL PANEL

John T. La Belle, Long Beach; Robert S. Szemeredi, Tujunga, and Matthew G. Tarnay, Pasadena, all of Calif., assignors to Price Pfister, Inc., Pacoima, Calif.

Continuation of Ser. No. 502,925, Jun. 10, 1983, abandoned. This application Jun. 7, 1985, Ser. No. 742,572
Int. Cl.[4] H01H *13/70, 3/12*
U.S. Cl. 200—159 B **6 Claims**



1. In a unitized switch control panel:

(a) a flat, thin cover plate made of electrically conductive, flexible and resilient material having an outer surface and an inner surface lying is spaced, parallel planes;

(b) said plate having on its outer surface, first grooves defining a plurality of discrete actuators in the normal, unflexed

condition of said plate, which are of unrestricted configuration and array, said actuators having digitally engageable surfaces substantially coplanar with said outer surface of said cover plate;

(c) said plate having on its inner surface, second grooves substantially paralleling the first grooves but laterally offset therefrom in directions parallel to the said planes of said cover plate surfaces;

(d) said second grooves defining contact pads for said actuators substantially in said plane of said inner surface of said plate;

(e) a circuit board having a plurality of pairs of contact segments arrayed to be bridged by said actuator pads when said actuator pads are depressed by digital pressure; and

(f) an insulation spacer in contact with the circuit board on one side and said panel on the other, and having a plurality of apertures for said pairs of contact segments.

4,620,076

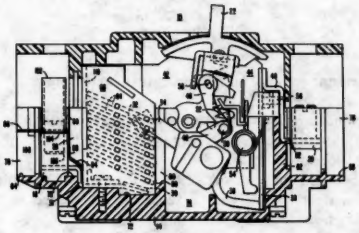
CIRCUIT BREAKER APPARATUS WITH LINE TERMINAL SHIELDS

Stephen A. Mrenna, Beaver, and Gale C. Vosler, South Beaver Township, Beaver County, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 27, 1985, Ser. No. 716,305

Int. Cl.[4] H01H *13/04, 9/02*

U.S. Cl. 200—304 **7 Claims**



1. A circuit breaker apparatus comprising:

(a) an electrically insulating housing having side walls forming a compartment and including a terminal within the compartment and between the sidewalls;

(b) a circuit breaker structure within the housing and having a pair of cooperable contacts operable between open and closed positions;

(c) a contact carrying arm for moving one of the contacts and pivotally mounted for movement between said positions; and

(d) an electrically insulating shield within the compartment and including a planar portion extending across the compartment and between the sidewalls, the planar portion having a hole through which a portion of the terminal projects, and the electrically insulating shield including a tubular portion extending through the hole and around the terminal.

4,620,077

INTEGRAL SWITCH CONNECTOR WITH REMOTE ACTUATOR

John Zdanys, Jr.; Tony J. Zaderej, and Matthew A. Robbins, all of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Feb. 19, 1985, Ser. No. 703,197

Int. Cl.[4] H01H *17/08*

U.S. Cl. 200—331 **20 Claims**

1. An integral switch connector apparatus with remote actuator, which comprises:

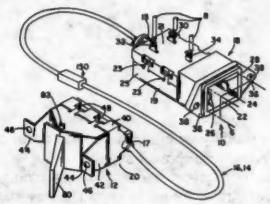
(a) a switch housing with at least a portion of said switch housing formed of a non-conductive material;

(b) a first plurality of conductive terminals disposed within the non-conductive portion of said switch housing;

(c) a second plurality of conductive terminals disposed within the non-conductive portion of said switch housing;

(d) a first slide member slidably disposed at least partially within said switch housing;

(e) resilient, conductive contact arms disposed in spaced relation within said switch housing, one end of each said contact arms operatively secured to at least one of said second plurality of conductive terminals, said contact arms positioned to be biased by said first slide member to make contact with at least one of said first plurality of conductive terminals when said first slide member is extended to a first operative position to provide electrical communication therebetween, said contact arms positioned to bias away from said first plurality of conductive terminals when said first slide member is retracted to a second operative position to break electrical communication therebetween;



(f) an elongated non-conductive, flexible external retaining sleeve, one end operatively secured to said switch housing;

(g) an elongated non-conductive, flexible actuator rod slidably received within said retaining sleeve, one end of said actuator rod operatively secured to said first slide member;

(h) a remote actuator housing, the opposite end of said retaining sleeve operatively secured to said actuator housing;

(i) a second slide member disposed at least partially within said actuator housing, the opposite end of said actuator rod operatively secured to said second slide member;

(j) means to manually bias said second slide member operatively secured to said actuator rod to selectively extend and retract said first slide member to remotely bias said contact arms to make and break electrical communication between at least one of said first and second plurality of conductive terminals, wherein the speed of movement between said first and second operative positions of said contact arms is independent of the speed of movement of said means to manually bias said second slide member.

4,620,078

POWER CONTROL CIRCUIT FOR MAGNETRON

Peter H. Smith, Anchorage, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 24, 1984, Ser. No. 664,321

Int. Cl.[4] H05B *6/68*

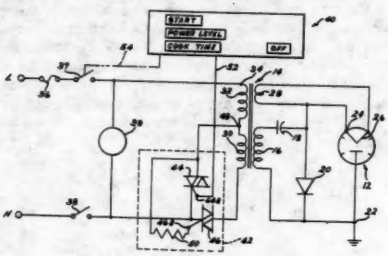
U.S. Cl. 219—10.55 B **7 Claims**

1. A duty cycle power control circuit for a microwave generating device of the type having an anode, a cathode, and a filament for heating the cathode and characterized by a threshold anode voltage level above which sufficient anode current flows to generate microwave energy and below which anode current is substantially zero, said control circuit comprising:

a power transformer comprising a primary winding adapted

for energization by an external power supply, a secondary anode winding for supplying an anode voltage to the microwave generating device and a secondary filament winding for supplying a filament-voltage to the microwave generating device, said primary winding comprising a main winding and a serially connected standby winding;

duty cycle controlled circuit means for periodically switching between a power on state and a standby state to implement the desired duty cycle for the microwave generating device, said duty cycle controlled circuit means being effective in its standby state to connect said main winding in series with said standby winding across an external



power supply and effective in its power on state to disconnect said standby winding and connect said main winding across the external power supply;

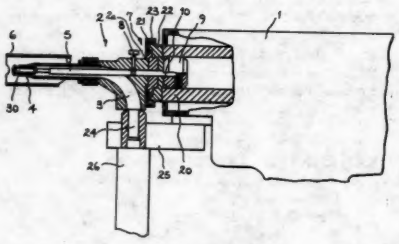
said power transformer windings being arranged such that when said circuit means is in its standby state the anode voltage applied to the microwave generating device is less than the threshold level and when in its power on state the anode voltage is greater than the threshold level and in both states the filament voltage is sufficient to maintain a filament temperature above a predetermined minimum temperature set sufficiently high to avoid moding in the microwave generating device.

4,620,079

STUD WELDING DEVICE

Günther Allmann, Biebertal, and Hans Wiessler, Wettenberg, both of Fed. Rep. of Germany, assignors to USM Corporation, Farmington, Conn.

Filed Oct. 3, 1985, Ser. No. 783,735
Int. Cl.[4] B23K *9/00, 11/04*
U.S. Cl. 219—98 **8 Claims**



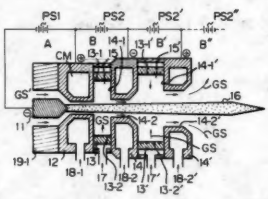
1. A stud welding device comprising a housing, a welding head, a stud-loading facility, a resiliently expandable collet and a reciprocable loading pin secured to a thrust piston operating in a pneumatic cylinder characterised in that the welding head is secured to the housing by means of a quick-releasable joint that the welding head is provided with a locking device for locking the loading pin inside the welding head the loading pin being detachably mounted in a bore of the thrust piston so that the welding head with the loading pin locked therein can, after releasing the joint be removed axially from the housing.

4,620,080

PLASMA JET GENERATING APPARATUS WITH PLASMA CONFINING VORTEX GENERATOR

Yoshiaki Arata, Amagasaki, and Akira Kobayashi, Takatsuki, both of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed Jun. 25, 1985, Ser. No. 748,421
Claims priority, application Japan, Jun. 27, 1984, 59-132783
Int. Cl.[4] B23K *9/00*
U.S. Cl. 219—121 PP **7 Claims**



1. A plasma jet generating apparatus comprising:

a torch center electrode;

a torch nozzle having first and second ends and into the first end of which said torch center electrode is directed;

a first DC power source connected across the first and the second ends of said torch nozzle for producing a plasma jet in cooperation with a working gas caused to flow through said torch nozzle; and

a vortex flow/discharge unit connected to said second end of said torch nozzle, said unit comprising:

a second DC power source, one end of which is connected to said torch nozzle;

a gas diverter nozzle spaced from the second end of said torch nozzle and to which the other end of said second DC power source is connected; and

a vortex flow chamber connected between said gas diverter nozzle and said torch nozzle, said chamber having a cylindrical shape defined by a cylindrical wall, said cylindrical wall having a plurality of sets of at least four through holes extending therethrough tangentially to the inside cylindrical surface of said cylindrical wall, the through holes of each set being spaced around the periphery of said cylindrical wall and the holes in each set being aligned with corresponding holes in the other sets along lines on the cylindrical wall which are parallel to the cylindrical axis of said chamber, said chamber having a donut-shaped end wall perpendicular to the cylindrical wall and on the end remote from said torch nozzle, said end wall being constituted by the end wall of said gas diverter nozzle which is toward said torch nozzle; and

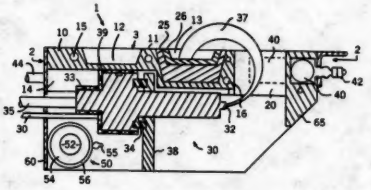
means for directing a working gas under pressure through said through holes into said vortex flow chamber for forming a vortex gas tunnel of the working gas enclosing the plasma jet therein, whereby the plasma jet is subjected to a thermal pinch effect through the gas tunnel and the plasma jet is produced while maintaining thermal isolation of the plasma jet from the inside wall of the gas diverter nozzle.

4,620,081

SELF-CONTAINED HOT-HOLLOW CATHODE GUN SOURCE ASSEMBLY

Joseph D. Zeren, Boulder, Colo., assignor to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Filed Aug. 3, 1984, Ser. No. 637,628
Int. Cl.[4] B23K 9/00
U.S. Cl. 219—121 EE 9 Claims



1. A self-contained hot-hollow cathode gun source assembly, for use in a vacuum chamber, comprising:

a crucible block having opposed and spaced upper and lower surfaces, first and second sides, front and rear portions, a coolant channel for conducting a coolant through said block, coolant input means for supplying a coolant to said channel, and coolant output means for removing a coolant from said channel;

said upper surface including means for holding a deposition material, and

a hole extending between said upper and lower surfaces, said hole being adjacent said front portion, said means for holding being between said hole and said rear portion;

first and second pole plates affixed to said first and second sides, respectively, of said block, each of said plates including:

an upper edge adjacent said upper surface of said block;

a lower edge extending below said lower surface of said block; and

a plate coolant channel connected at one end to said block coolant channel and at an opposite end to one end, respectively, of first and second tubular dielectric connectors;

a hot-hollow cathode gun having a tubular output end including a tip for releasing an ion/electron beam, an opposed input end including means for supplying gas and means for supplying electricity to said gun, and a coolant channel for conducting a coolant through said gun;

the other end of each of said dielectric connectors being connected to said gun coolant channel, whereby coolant circulates from said input means through said block and said gun to said output means;

means for mounting said gun between said pole plates adjacent said lower surface of said block, said means for mounting comprising a gun support plate extending between said pole plates and having an upper edge adjacent said lower surface of said block, said gun output end protruding through a hole in said support plate, said tip being adjacent said hole;

a dielectric shield surrounding said gun input end, whereby electrical discharge between said input end of said gun and said pole plates, said support plate and said lower surface is prevented; and

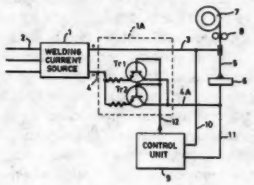
deflection magnet means connected between said pole plates for deflecting the beam from said tip through said hole to said means for holding a deposition material.

4,620,082

PULSED ARC WELDING APPARATUS

Brian A. Graville, Georgetown, and Edward Shmakov, Toronto, both of Canada, assignors to Welding Institute of Canada, Ontario, Canada

Continuation of Ser. No. 419,032, Sep. 15, 1982, abandoned. This application Nov. 30, 1984, Ser. No. 676,228
Claims priority, application Canada, Aug. 31, 1982, 410482
Int. Cl.[4] B23K 9/09
U.S. Cl. 219—130.51 10 Claims



1. A pulsed arc welding system, comprising:

a welding electrode;

a single power source for supplying a welding current to said welding electrode to create a welding arc between said welding electrode and a workpiece in response to a control signal;

welding current regulator means comprising at least one transistor having its emitter connected to said single power source and its collector connected to said workpiece for providing a continuous background current component, said transistor also providing a pulse current component superimposed on said continuous background current component to said welding electrode;

means for detecting the magnitude of the arc voltage of the welding arc and providing an arc voltage signal;

means for processing said arc voltage signal independently of any other detection of the operating parameters of said pulse arc welding system to provide a pulse control signal;

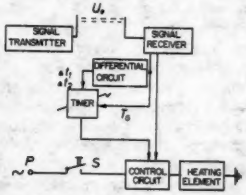
conductor means for feeding said pulse control signal to said at least one transistor whereby the frequency of said pulse control signal is proportional to the magnitude of the arc voltage, said pulse control signal being connected to the base of said at least one transistor to control said welding current applied to said welding electrode.

4,620,083

DEVICE FOR REGULATING THE COOKING PROCESS IN A COOKING VESSEL

Wolfram K. Andre, Eichenweg, Fed. Rep. of Germany, assignor to Kurt Wolf & Co. KG, Fed. Rep. of Germany

Filed Mar. 15, 1984, Ser. No. 590,420
Claims priority, application Fed. Rep. of Germany, Apr. 21, 1983, 3314398
Int. Cl.[4] H05B 1/02
U.S. Cl. 219—491 6 Claims



1. In an apparatus of the type comprising a control circuit means and a timer means for regulating the cooking process in a cooking vessel heated by a heating element, wherein a desired cooking time is preset with said timer means, the im-

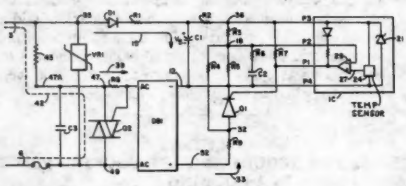
provement comprising: a signal transmitter means (TF) transmitting signals corresponding to the temperature in said cooking vessel to a signal receiver means (TE), said signal receiver means (TE) transmitting control signals proportional to said temperature in said cooking vessel to a control circuit means (ST), to a differential circuit means (DS), and to said timer means (GT), said control circuit means (ST) controlling said heating element (HE) during a heating phase extending from the time said heating element is activated until said desired cooking temperature (T_G) is reached, and during said cooking process, said timer means (GT) starting to measure said preset cooking time only after a desired cooking temperature (T_G) has been reached, said differential circuit means (DS) detecting differences between successive control signals over time and deriving a correction signal therefrom proportional to the slope of a temperature-time curve derived during said heating phase and transmitting said correction signal to said timer means (GT), said timer means (GT) adjusting said preset time (t_G) to an adjusted preset time by subtracting a time interval proportional to said correction signal from said preset time (t_G) and signalling said control circuit means (ST) after said adjusted preset time has elapsed and prior to elapse of said preset cooking time (t_G), said time interval increasing as said slope of said temperature-time curve in said heating phase decreases, and said control circuit means (ST) turning off said heating element upon receipt of said signal from said timer means (GT).

4,620,084

AIRCRAFT THERMOSTAT

Charles R. Cunningham, Seattle, and Glenn S. Godden, Woodenville, both of Wash., assignors to General Electric Company, Cincinnati, Ohio

Filed Dec. 27, 1983, Ser. No. 566,095
Int. Cl.[4] H05B *1/02*
U.S. Cl. 219—497 **6 Claims**



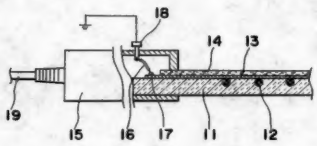
1. A temperature controller, comprising:
(a) a power supply circuit comprising a bridge rectifier (DB1) having two input leads;
(b) a temperature sensing circuit (IC) which receives power from the rectifier and which produces a temperature signal in response to the temperature of a fluid;
(c) means (R3, R5) for providing a reference signal;
(d) switching means (Q1) for connecting and disconnecting at least one resistor (R4) to the recitifier in order to alter the current supplied by the rectifier;
(e) comparator means (29) for comparing the temperature signal with the reference signal and for closing the switching means when the two signals attain a predetermined relationship, thereby increasing the current supplied by the rectifier; and
(f) a Triac (Q2) which is coupled to the rectifier such that the Triac is triggered into conduction by the current increase of (e), thereby completing a circuit through a heater for heating the fluid and substantially shorting the input leads of the rectifier, thus opening the switching means thereby reducing the current supplied by the rectifier.

4,620,085

FLOOR COVERINGS HAVING BUILT-IN HEATER

Toshihiro Horikawa, and Nobumori Kuwabara, both of Nara, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Aug. 7, 1984, Ser. No. 638,614
Claims priority, application Japan, Aug. 12, 1983, 58-125733
Int. Cl.[4] H05B *3/34*
U.S. Cl. 219—528 **7 Claims**



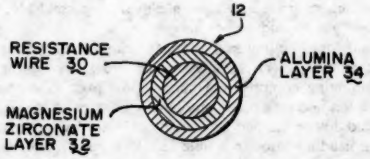
1. A floorcovering having a built-in heater, comprising a planar sandwich structure including an underlining layer of heat insulating material, at least one electrically insulated heating element provided on one surface of the underlining layer, a metallic foil provided on said one surface of the underlining layer so as to cover the heating element, a surfacing layer overlying the metallic foil on one side of the heating element opposite to the underlining layer, and electrical means for electrically and mechanically connecting the metallic foil to ground; and a power take-in unit having means for supplying external electric power therethrough to the heating element, said power take-in unit including a protective casing having a wall, said surfacing layer and said underlining layer extending into said wall and being secured to said wall, said metallic foil extending into said casing through said wall, said electrical connecting means extending into said casing, said metallic foil and said electrical connecting means being connected together in said casing, whereby said casing protects the connection between said metallic foil and said electrical connecting means from external physical forces, said underlining layer, said at least one heating element, said metallic foil, said surfacing layer, said electrical connecting means and said protective casing being secured together.

4,620,086

DUAL COATED RADIANT ELECTRICAL HEATING ELEMENT

Adrian R. Ades, Schenectady; Paul B. Pribis, Saratoga, and Donald J. Proach, Rotterdam, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sep. 30, 1985, Ser. No. 781,380
Int. Cl.[4] H05B *3/10*; H01B *7/00*; H01C *1/02*; B05D *3/02*
U.S. Cl. 219—552 **7 Claims**



1. An electrical heating element comprising, in combination:
A. a resistance wire;
B. a coating of magnesium zirconate applied to said wire; and
C. a coating of alumina applied to said magnesium zirconate coating.

4,620,087

INITIALIZE CONTROL SYSTEM IN A CASH PROCESSING SYSTEM

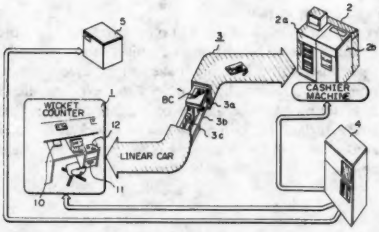
Yoshihiko Aizaki, Kawasaki, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Filed Nov. 30, 1984, Ser. No. 677,138

Claims priority, application Japan, Nov. 30, 1983, 58-226388; Dec. 13, 1983, 58-234510

Int. Cl.[4] G06F *15/30*

U.S. Cl. 235—379 20 Claims



1. A cash processing system comprising: a wicket terminal having a take-out port for taking out the cash; a cashier terminal for disbursing the cash; a carrier path connecting the wicket terminal to the cashier terminal; a carrier which runs on the carrier path; and a system controller which sends cash disbursing instructions to said cashier terminal in response to a cash disbursing request from the wicket terminal, so that said carrier carries the cash disbursed by the cashier terminal; wherein said system controller further comprises memory means which stores the cash disbursing request sent from the wicket terminal; and control means which transfers said carrier to the wicket terminal from where the cash disbursing request is executed, when initialize instructions are issued during the cash disbursement processing being executed in response to the cash disbursing request.

4,620,088

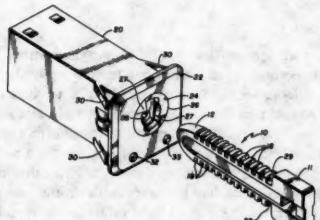
RECEPTACLE DESIGN FOR USE WITH ELECTRONIC KEY-LIKE DEVICE

William P. Flies, Burnsville, Minn., assignor to Datakey, Inc., Burnsville, Minn.

Filed Mar. 2, 1983, Ser. No. 471,424

Int. Cl.[4] G06K *7/06*

U.S. Cl. 235—443 30 Claims



1. An electrical receptacle which is electrically activated by insertion and rotation of an electronic key-like device having electrical contact surface areas thereon for mating with corresponding contacts in the receptacle, the receptacle comprising:

an elongate housing including a receptacle contact support portion and a slotted enclosure portion, the receptacle contact support portion and slotted enclosure portion defining an elongate interior housing chamber having an open end into which an electronic key-like device may be inserted and rotated in the chamber; and

a set of spaced electrical contact pins arranged along at least one side of the chamber defining electrical contacts for the receptacle, each pin extending from the contact support portion of the housing into the housing chamber, one end thereof being fixed in the contact support and being free at the opposite end, the free ends of the pins being respectively received in a corresponding slot in the housing enclosure portion, the slots being arranged to allow unrestrained movement of the contact pins therein so that, as an inserted key-like device is rotated in the receptacle, each contact thereon is urged into engagement with a respective pin causing movement of the pins in the slots during rotation of the key-like device.

4,620,089

AUTOMATIC OPTICAL FOCUSING DEVICE

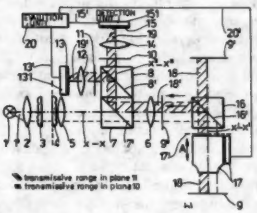
Johannes Schlichting, and Kerstin Halwass, both of Jena, German Democratic Rep., assignors to Jenoptik Jena G.m.b.H., Jena, German Democratic Rep.

Filed Apr. 8, 1985, Ser. No. 721,254

Claims priority, application German Democratic Rep., May 2, 1984, 262570

Int. Cl.[4] H01J *40/14;* G01J *1/20*

U.S. Cl. 250—201 5 Claims



1. An auto-focusing device, particularly for positioning reflective objects under investigation

in a measuring apparatus,

comprising about an optical axis in mutual optical alignment,

a light source for emitting a narrow spectral band radiation,

means for producing a plurality of images of said light source,

said plurality of images serving as an illumination beam,

a first and a second lens,

a first beam splitter being for folding said optical axis at right angles to itself,

an objective lens being arranged subsequently to said beam splitter in the folded optical axis,

said objective lens having an object plane and an image plane,

said first beam splitter having a beam splitting face inclinedly arranged by 45° relative to said optical axis and to said folded optical axis,

said first and said second lens being for directing said illumination beams for illuminating said object plane via said first beam splitter and said object lens,

a reflective object to be measured,

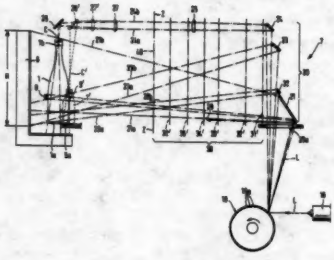
said reflective object being for producing a focusing beam and an imaging beam,
said objective lens being for imaging said reflective object into said image plane for evaluation,
said beam splitting face being for transmitting said imaging beam and for reflecting said focusing beam to propagate in opposite direction to said illumination beam,
a deviating means being inserted into said focusing beam between said second and said first lens,
said deviating means being for directing said focusing beam at right angles to said optical axis,
means for producing a first beam portion and a second beam portion, from said focusing beam,
said means for producing said first and said second beam portion being arranged subsequently to said deviating means in said focusing beam,
a first aperture being arranged in said first beam portion,
a second aperture being arranged in said second beam portion,
a first detector unit,
a second detector unit,
said first aperture being for producing two first individual images from said plurality of images transfered by said first beam portion,
first means for producing a first interference pattern by superimposing said two individual images in said first detector unit,
said second aperture being for producing two second individual images from said plurality of images transfered by said second beam portion,
second means for producing a second interference pattern by superimposing said two second individual images in said second detector unit,
an evaluation unit being connected to said first and said second detector unit, on the one hand, and to an adjustment means, on the other hand, incorporated in said objective lens for performing adjustment movements of the latter along said folded optical axis,
said first detector unit and said second detector unit being for producing signals indicative of an
actual focus position of said objective lens, and of the direction of defocusing, if any,
said signals being compared to a focused position value stored in said evaluation unit,
said evaluation unit being for feeding an adjustment signal to said adjustment means when said objective lens being out-of-focus.

4,620,090

METHOD AND APPARATUS FOR OPTICAL INSPECTION OF TRANSPARENT ARTICLES

Marcel L. Ducloux, Carrieres sur Seine, France, assignor to Saint-Gobain Cinematique et Controle, Gennevilliers, France

Filed Jan. 15, 1985, Ser. No. 691,595
Claims priority, application France, Jan. 17, 1984, 84 00657
Int. Cl.[4] G01N *21/90, 21/15*
U.S. Cl. 250—223 B **20 Claims**



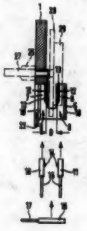
1. An apparatus for optical checking of transparent or translucent objects comprising a star wheel for transporting said objects in continuous movement, means in peripheral contact with an object to rotate such object while it is being transported by said star wheel, means for generating a laser light beam, said laser light beam being directed onto a revolving mirror which directs the beam to a plurality of distributing mirrors in a multiple reflection light box to create an oscillating laser light beam field, means for tracking said object to be checked with said oscillating light beam field while said object is rotated, and photosensitive receiver means for receiving said laser light beam
characterized in that:
(a) the means which rotate said object contact said object at an intermediate height on said object; and
(b) said distributing mirrors make at least two distinct portions of said laser light beam field converge on said object at differing average angles of inclination such that the entire surface of the object can be checked by avoiding any blind spot created by said means which rotate said object.

4,620,091

MOUNTING SUPPORT FOR SEVERAL PHOTOTRANSMITTERS AND PHOTORECEIVERS

Manfred W. Zebisch, Georgensgmünd, Fed. Rep. of Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 19, 1983, Ser. No. 562,663
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247447
Int. Cl.[4] G01D *5/34*
U.S. Cl. 250—231 SE **3 Claims**



1. Mounting support for several phototransmitters and photoreceivers comprised of a baseplate having a plurality of pairs of U-shaped members, each perpendicular to said baseplate with its two legs parallel to said base-plate and a slot in each leg along its length for receiving said phototransmitters and photoreceivers, each slot forming a bearing surface for a phototransmitter or photoreceiver, arranged in pairs with a distance being left free between each one phototransmitter and one photoreceiver of a pair sufficient for a light interrupting member to be moved therebetween, characterized in that on the mounting support there are provided by said slots in each pair of U-shaped members one pair of associated insertion openings in the parallel legs of said U-shaped members, which are spaced apart at least by said distance and into which each one phototransmitter or photoreceiver is capable of being inserted, and that within the area of each insertion opening there is provided a locking means with the aid of which the inserted phototransmitter or photoreceiver, in the inserted state, is capable of being locked in a coaxially aligned position.

4,620,092

ELEVATION ANGLE MEASURING DEVICE WITH APPARATUS FOR DISABLING THE DEVICE WHEN ITS INCLINATION ANGLE IS OFFSET FROM A PREDETERMINED INCLINATION ANGLE

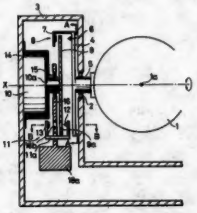
Masato Hara, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 21, 1983, Ser. No. 553,946

Claims priority, application Japan, Nov. 24, 1982, 57-177448[U]

Int. Cl.[4] G01B *11/26*

U.S. Cl. 250—231 SE 11 Claims



6. An elevation angle measuring device of the type including measuring means for measuring the angle of inclination of an apparatus with respect to a support, said device further comprising disabling means for disabling said device in response to inclination of said support.

4,620,093

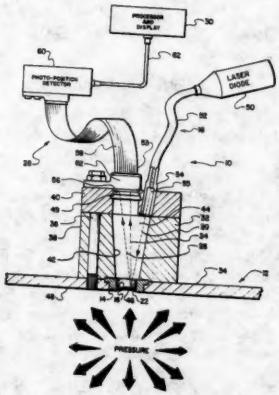
OPTICAL PRESSURE SENSOR

Sarkis Barkhoudarian, Canoga Park; Rudolf R. Aügüst, Laguna Beach, and Jonathan M. Maram, Chatsworth, all of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Oct. 31, 1983, Ser. No. 547,305

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 P 18 Claims



1. An optical pressure sensor for measuring the pressure within a container, comprising:

a housing affixed to said container, said housing having interior surfaces;

a pressure deflectable diaphragm securely emplaced by said housing, said diaphragm having a bottom surface in communication with the pressure within said container and an upper surface having a diffraction grating formed thereon, said upper surface and said interior surfaces of said housing defining an internal chamber;

means external to said housing for generating a laser beam;

an optical fiber secured to said housing and connected to said laser generating means for directing said generated laser beam into said internal chamber to strike said diffraction grating on said upper surface of said pressure deflectable diaphragm, said laser beam thereby forming within said internal chamber a central diffracted beam and a first order diffracted beam;

a fiber optic ribbon having a receiving end secured within said internal chamber across the paths of said central diffracted beam and said first order beam;

a photo-position detector external to said housing and connected to said fiber optic ribbon, said fiber optic ribbon and photo-position detector cooperating to serve as means for generating signals responsive to the position of said central diffracted beam and said first order beam; and

a processor for receiving said responsive signals from said photo-position detector and for correlating said responsive signals to a temperature compensated indication of the pressure within said container.

4,620,094

PHOTOELECTRIC ENCODER

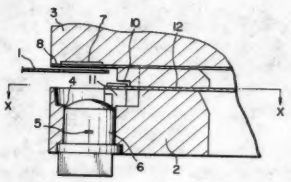
Zempei Tani, Tondabayashi; Kiyoshi Ebina, Nara; Osamu Ichikawa, Matsubara, and Mamoru Imaizumi, Nagoya, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka and Brother Industries, Ltd., Nagoya, both of, Japan

Filed Jun. 5, 1984, Ser. No. 617,351

Claims priority, application Japan, Sep. 3, 1983, 58-137226[U]

Int. Cl.[4] G01D *5/34*

U.S. Cl. 250—231 SE 4 Claims



1. Photoelectric encoder comprising;

a disk mounted for rotation with an outer circumference and a rotating member, and having a plurality of alternately arranged opaque and translucent portions arranged in a substantially circular timing track about the radial center of said disk;

a light emitting element disposed on one side of said disk at a position opposite one of said translucent positions, said light emitting element being provided for encoding and for intensity control;

a light sensitive unit disposed on the other side of said disk and responsive to the angular displacement of said opaque and translucent timing track portions when said rotating member is rotated for generating an output signal to detect the rotational position and the rotational direction;

the light emitting element and light sensitive element being positioned radially inward from the outer circumference; and

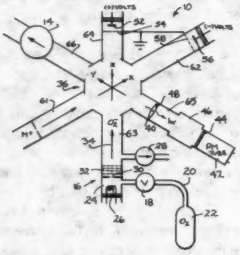
feedback means for substantially stabilizing the output signal of said light sensitive unit and having a light sensitive means disposed on said one side of said disk at a position to directly receive light radiation emitted by said light emitting element for generating an electrical signal representative of the intensity of said light radiation which may be used to control said intensity.

4,620,095

ION NEUTRALIZATION RESONANCE EMISSION ELEMENTAL DETECTOR

Andrzej W. Miziolek, 200 Cable St., Caltimore, Md. 21210

Filed Jan. 18, 1984, Ser. No. 571,894
Int. Cl.[4] H01J 49/00
U.S. Cl. 250—281 14 Claims



1. Machine for selectively detecting presence of particular analyte trace elements in a given positively ionized beam of particles, including distinguishing a particular analyte from other elements having the same m/e, mass to charge ratio, comprising:

means for forming a negatively ionized oxygen beam for collision with said given particle beam;

evacuated chamber means in which the said positively and negatively ionized beams are collided;

means for viewing light coming from the intersection of said beams' collision at select frequencies of analysis;

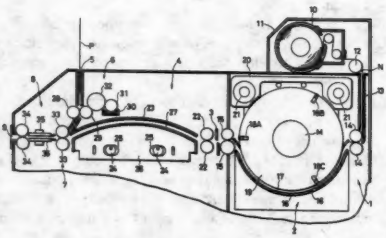
whereby light photons emanating from said collision at select viewed frequencies, indicative of resonant behavior unique to particular known element, identifies the particular analyte element under analysis.

4,620,096

THERMAL DEVELOPING AND TRANSFERRING METHOD

Nobumitsu Takehara; Kazuhiko Yanagihara; Masahiro Ohnishi, and Shigeo Harada, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 593,002, Mar. 23, 1984, which is a continuation of Ser. No. 545,294, Oct. 25, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 814,023
Claims priority, application Japan, Oct. 25, 1982, 57-186921
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—319 7 Claims



1. An image recording apparatus comprising:

exposure means for scan exposing a front side of a thermally developable photo-sensitive material having an electrically heating layer in its back surface, said exposure means including means for modulating and activating light sources, having different wavelengths, in response to three basic color signals, thereby forming a latent image on said thermally developable photo-sensitive material;

a thermal development section having at least two electrode rollers brought into contact with said electrically heating layer provided on the back surface of said photo-sensitive material in which said latent image has been formed, said thermal development section applying a voltage between said electrode rollers and heating said electrically heating layer, thereby achieving the development of said thermally developable photo-sensitive material;

means for applying a diffusion agent in a fluid state to an image receiving material having a layer for pigments;

overlaying means for overlaying said image receiving material subjected to said diffusion with the developed photo-sensitive material;

transferring means for heating the overlaid image receiving material and photo-sensitive material at a temperature less than a temperature in said thermal development section, thereby transferring the image, formed in said photo-sensitive material, to said image receiving material; and

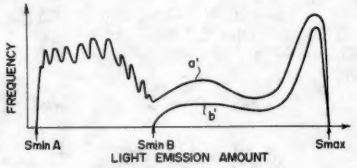
peeling means for peeling the overlaid image forming material apart from said photo-sensitive material.

4,620,097

METHOD OF ADJUSTING SCALE FACTOR FOR RADIATION IMAGE

Hiroshi Tanaka; Yuuma Adachi, and Nobuyoshi Nakajima, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Nov. 19, 1984, Ser. No. 673,238
Int. Cl.[4] G03C 5/16
U.S. Cl. 250—327.2 6 Claims



1. A method of adjusting a scale factor for a radiation image wherein the scale factor in final read-out for exposing a stimulable phosphor sheet carrying the radiation image stored therein to stimulating rays which cause the stimulable phosphor sheet to emit light in proportion to the stored radiation energy, and photoelectrically detecting the emitted light to obtain a visible image is adjusted by, prior to the final read-out, conducting preliminary read-out for detecting the radiation image stored in the stimulable phosphor sheet by use of stimulating rays having stimulation energy lower than stimulation energy of stimulating rays used in the final read-out,

the method of adjusting a scale factor for a radiation image comprising the steps of:

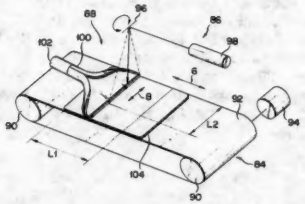
(i) by the preliminary read-out, measuring the minimum stimulated emission intensity among all points over the whole surface of said stimulable phosphor sheet and the minimum stimulated emission intensity among all points in one region within a radiation exposure field of said stimulable phosphor sheet at the time of the radiation image recording, and

(ii) adjusting the scale factor in the final read-out in accordance with the difference between the measured minimum stimulated emission intensities.

4,620,098
RADIATION PHOTOGRAPHING APPARATUS

Shigemi Fujiwara, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Japan

Filed Aug. 1, 1984, Ser. No. 636,592
Claims priority, application Japan, Aug. 2, 1983, 58-140587
Int. Cl.[4] G03G 5/16
U.S. Cl. 250—327.2 6 Claims



1. A radiation photographing apparatus for photographing a radiation-penetrated image of a patient in several sizes, comprising:

radiation image converting panels each absorbing the energy of radiation and emitting this energy as phosphorescence when they are irradiated by a light beam, said panels having coded information corresponding to a predetermined photographing area on said panels;

spot shot means including a feed magazine for housing the radiation image converting panels, a holder for holding the radiation image converting panel supplied from the feed magazine and setting it at a radiation photographing position, and signal means for reading the coded information and for producing an output signal corresponding to said coded information;

means for exposing radiation at said predetermined photographing area on the radiation image converting panel which has been set at the photographing position, with the patient interposed between the panel and the radiation exposing means;

means for reading a radiation-penetrated image from the radiation image converting panel which has been exposed by radiation, said reading means including a light beam irradiating means for scanning the radiation image converting panel with a light beam, and detector means for detecting the phosphorescence when irradiated by the light beam and converting it to an electric detection signal;

image reproducing means for receiving said detection signal from the reading means and carrying out image-treatment on the basis of said detection signal to display a radiation-penetrated image; and

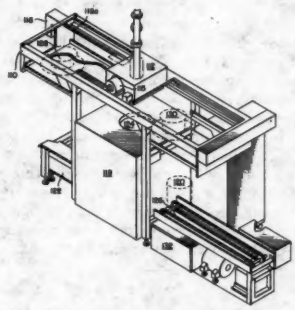
control means for recognizing said predetermined photographing area based on the output signal of the signal means and adjusting the scanning area of the light beam of said reading means to said photographing area.

4,620,099
AUTOMATED MONITORING OF FISSILE AND FERTILE MATERIALS IN INCINERATOR RESIDUE

Frederick C. Schoenig, Jr., Wilmington, N.C.; Sharon G. Glendinning, Palo Alto; George W. Tunnell, Foster City, both of Calif., and Martin S. Zucker, East Moriches, N.Y., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 26, 1983, Ser. No. 526,582
Int. Cl.[4] G01F 23/00
U.S. Cl. 250—358.1 3 Claims

1. Apparatus for determining the fissile and fertile material content of incinerator residue contained in a manipulatable container, comprising: a main body member formed of neutron moderating material and formed with a well for receiving said container; a first plug formed of neutron reflecting material for closing the top of said well; a second plug containing a first neutron source for alternatively closing the top of said well and for directing neutrons into said well; a second neutron source selectively positionable in the bottom of said well for directing neutrons into said well; manipulating means for placing said container in said well and removing said container therefrom and for selectively placing one of said first and

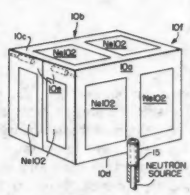


second plugs in the top of said well; a plurality of neutron detectors positioned within the neutron moderating material of said main body member around the sides of said well; at least one gamma ray detector positioned adjacent the bottom of said well; and means for receiving and processing the signals from said neutron and gamma ray detectors when said container is in said well for determining the fissile and fertile material content of the incinerator residue in said container.

4,620,100
AUTOMATED MONITORING OF FISSILE AND FERTILE MATERIALS IN LARGE WASTE CONTAINERS

Frederick C. Schoenig, Jr., Wilmington, N.C.; Sharon G. Glendinning, Palo Alto, Calif.; Timothy Schick, Wilmington, N.C., and Samuel Untermyer, II, Portola Valley, Calif., assignors to General Electric Company, San Jose, Calif.

Filed Aug. 26, 1983, Ser. No. 526,578
Int. Cl.[4] G01F 23/00
U.S. Cl. 250—358.1 2 Claims



1. Apparatus for determining the amount of U-235 and U-238 which is contaminating combustible waste material contained in a combustible box, comprising: a box monitor structure for receiving said box and having side members, a top member, a bottom member; a first plurality of radiation detectors mounted on said side, top and bottom members of said monitor structure for producing first signals in response to passive radiation from radioactive material in said box; circuit means for receiving and processing said first signals including energy discrimination, signal counting and signal coincidence analysis to provide first processed signals indicating the U-238 content of said box; a second plurality of radiation detectors or energy discriminating type positioned adjacent said monitor structure for producing second signals in response to passive gamma radiation from radioactive material in said box; circuit

means for receiving and processing said second signals including energy analysis of said signals to provide second processed signals; a neutron source selectively movable to a position adjacent said monitor structure for directing neutrons into said box therein for activation of the radioactive material in said box, said first plurality of radiation detectors providing third signals in response to radiation induced in said radioactive material in said box by neutrons from said neutron source; circuit means for receiving and processing said third signals including energy discrimination and signal coincidence analysis to provide third processed signals, indicative of U-235 content of said box; a third plurality of radiation detectors responsive to neutrons positioned adjacent said monitor structure for producing fourth signals in response to neutrons resulting from fission of U-235 in said box induced by irradiation of said U-235 by the neutrons from said neutron source; circuit means for receiving and processing said fourth signals including counting said signals to provide fourth processed signals; and means for analyzing and for comparing said first, second, third and fourth processed signals against signals obtained from standards of known composition for providing an indication of the U-235 and U-238 content of said box.

4,620,101

CHARGING SWITCH FOR A BAR DOSIMETER FOR IONIZING RADIATION

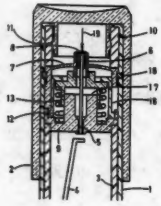
Werner Merkel, Erlangen-Möhrendorf, Fed. Rep. of Germany, assignor to Fag Kugelfischer Georg Schafer KGaA, Fed. Rep. of Germany

Filed Dec. 5, 1984, Ser. No. 678,463

Claims priority, application Fed. Rep. of Germany, Dec. 7, 1983, 3344189

Int. Cl.[4] G01T *1/18*

U.S. Cl. 250—376 **14 Claims**



1. A charge switch for a bar type dosimeter for ionizing radiation, comprising:

a hollow housing surrounded by a peripheral wall;

a flexible, deflectable membrane located inside and fastened to the housing, the membrane being of a size and of a material to be deflected; the membrane having a central substantially unflexed position and being deflectable to a first downwardly convex flexed position and a second downwardly concave flexed position, said two positions being on opposite sides of the central position;

a charge contact pin supported in the membrane, the pin being oriented for axial displacement upon deflection of the membrane in which the pin is supported;

an electric contact disposed in the housing toward one end of the pin; upon selective deflection of the pin in a first downward direction, said membrane then being in said first position, the pin being brought into engagement with the contact in the housing, and upon deflection of the pin in a second opposite direction, said membrane then being in said second position, the pin being deflected away from the contact;

a first stop in the housing positioned for blocking further deflection of the membrane in the first direction when the pin engages the electric contact;

a second stop in the housing positioned for establishing the extent of deflection of the pin and the membrane in the second direction away from the electric contact; and

biasing means for normally biasing the pin and membrane to deflect toward the second direction.

4,620,102

ELECTRON-IMPACT TYPE OF ION SOURCE WITH DOUBLE GRID ANODE

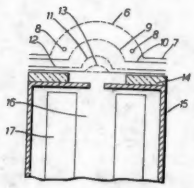
Fumio Watanabe, Fukushima; Yoshiaki Hara, Tokyo; Masao Miyamoto, Tokyo; Yasuo Kusumoto, Tokyo, and Syojiro Komaki, Tokyo, all of Japan, assignors to Seiko Instruments & Electronics Ltd., Tokyo, Japan

Filed Mar. 25, 1985, Ser. No. 715,498

Claims priority, application Japan, Mar. 26, 1984, 59-58030

Int. Cl.[4] H01J *27/20*

U.S. Cl. 250—427 **2 Claims**



1. In an electron-impact type of ion source of a three-electrode construction comprising at least a hot-cathode filament, an anode, and an ion-extraction electrode, an electron-impact type of ion source with a double grid anode characterized in that said anode is comprised of a first cage-like anode made of a metal grid or wire gauze that permits the passage of electrons and that has an open end, a second anode which also consists of a metal grid or wire gauze located at the open end side of said first anode, a hot-cathode filament arranged around the outer periphery of said first anode, and an ion-extraction electrode which faces said anode.

4,620,103

SAMPLE HOLDER FOR MASS ANALYSIS

Hideki Kambara, Hachioji, and Setsuko Seki, Tokyo, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Nov. 30, 1984, Ser. No. 676,923

Claims priority, application Japan, Dec. 2, 1983, 58-226855

Int. Cl.[4] G01F *21/00, 23/00*

U.S. Cl. 250—440.1 **3 Claims**

1. A sample holder for mass analysis of secondary ions produced by irradiation of a fast particle beam to a sample to be analyzed, said sample holder comprising:

box means for providing a space in which a fluid matrix and a sample material is held, said sample material being arranged to face toward said irradiation;

slit means with its opening allowing said space to communicate with the exterior of said box means; and

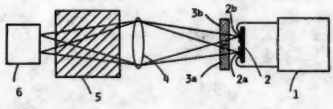
means for narrowing said space at the opening of said slit means.

4,620,104

INFRARED RADIATION SOURCE ARRANGEMENT

Per-Erik Nordal, Tappen 38, 1300 Sandvika, and Svein O. Kanstad, Conrad Holboes vei 67, 9000 Troms , both of Norway

PCT No. PCT/NO83/00006, § 371 Date Sep. 28, 1983, § 102(e) Date Sep. 28, 1983, PCT Pub. No. WO83/03001, PCT Pub. Date Sep. 1, 1983
PCT Filed Feb. 16, 1983, Ser. No. 545,388
Claims priority, application Norway, Feb. 22, 1982, 820544
Int. Cl.[4] G01J 3/10; H05B 3/26
U.S. Cl. 250—493.1 26 Claims



1. An improvement infrared radiation source arrangement for use in producing at least one pulsating beam of infrared radiation having

an electrically insulating substrate, at least one resistive element comprising an electrically conducting film carried on one surface of said substrate, and electrical circuit means for energising and controlling the emission of infrared radiation from said at least one resistive element; in which the improvement comprises that said electrical circuit means is arranged to energise said at least one resistive element with pulsating current whereby pulsating thermal infrared radiation is emitted, and that the thickness (L) of the substrate, and the thermal conductivity (k), specific heat capacity (C) and density (ρ) of the substrate material are so chosen that the time constant τ_s of the substrate, where

$$\tau_s = \frac{L^2 \pi \rho C}{k},$$

approximately satisfies the relationship τ_s being less than or approximately equal to f^{-1} where f is the highest pulsation frequency contained in the energising current as provided by the electrical circuit means.

4,620,105

DEVICE FOR ATTACHING A COLLIMATOR TO A RADIATION DETECTOR

Anatoly I. Gosis, 552 Burno Dr., Palatine, Ill. 60067; Margaret Fialko, 8835 Mango, Morton Grove, Ill. 60053, and George J. Hanz, 254 Thrasher, Bloomingdale, Ill. 60108

Filed Mar. 12, 1984, Ser. No. 588,845
Int. Cl.[4] G01B 5/00; G21K 1/02
U.S. Cl. 250—505.1 17 Claims

1. A device for attaching a collimator to a radiation detector, comprising

a. a cleat means at the radiation detector for cleating the collimator to the radiation detector;

b. a latch means for latching the cleated collimator against rotation;

c. a collimator cleating detection means associated with the cleat means for detecting incorrect cleating of the collimator; and

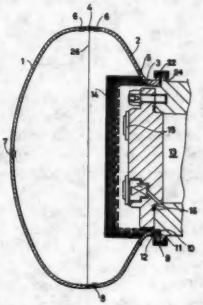
d. a collimator latching detection means associated with the latch means for detecting incorrect latching of the collimator.

4,620,106

IMPACT ABSORBER FOR CONTAINERS FOR NUCLEAR FUEL AND/OR DANGEROUS SUBSTANCES

Antonio Olivieri, Milan, and Giovanni Pochini, Noverasco di Opera, both of Italy, assignors to AGIP Nucleare S.p.A., Rome, Italy

Filed Oct. 3, 1983, Ser. No. 538,742
Claims priority, application Italy, Oct. 11, 1982, 23701 A/82
Int. Cl.[4] G21F 5/00
U.S. Cl. 250—506.1 19 Claims



1. An impact absorber for a container for irradiated nuclear fuels, radioactive products and/or dangerous chemicals comprising:

a first open convex structure having one open end at its maximum diameter;

a second annular convex structure having a large opening formed at the maximum diameter of said second annular convex structure, said large opening corresponding to said open end of said first open convex structure, said second annular convex structure having a minor opening formed at the minimum diameter thereof and approximating the dimension of the end of the container, said first open convex structure and said second annular convex structure being connected at said first structure open end and said second annular convex structure large opening to form an impact absorber shell;

an annular connector attached to said second annular convex structure at said minor opening; and

ring connector means for connecting said impact absorber shell at said annular connector to said container, said impact absorber shell and said container defining an interspace therebetween, said interspace being pressurized or depressurized relative to the surrounding environment to prevent release to the environment of the substances contained in the container.

4,620,107

COMPENSATED LIGHT PEN WITH VARIABLE ATTENUATOR

Gary E. Frame, Reseda, Calif., assignor to Liprad Associates, Hanford, Calif.

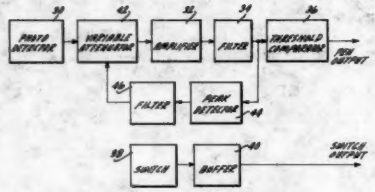
Filed Sep. 10, 1984, Ser. No. 649,061
Int. Cl.[4] G09G 3/02; G06K 7/10
U.S. Cl. 250—566 20 Claims

1. An automatically compensated light pen for use with a

video display monitor incorporating a cathode ray tube, including,

a detector for detecting light pulses produced by the cathode ray tube when the detector is positioned adjacent the cathode ray tube at a particular desired location and for producing electrical pulses in accordance with the light pulses,

a variable attenuator having a first input coupled to the output of the detector and responsive to the electrical pulses from the detector for producing variably attenuated electrical pulses and having a second control input responsive to a control signal for controlling the level of the variably attenuated electrical pulses,



a threshold comparator coupled to the output of the variable attenuator and responsive to the variably attenuated electrical pulses for producing output electrical pulses when the level of the variably attenuated electrical pulses are higher than a particular threshold level for the threshold comparator, and

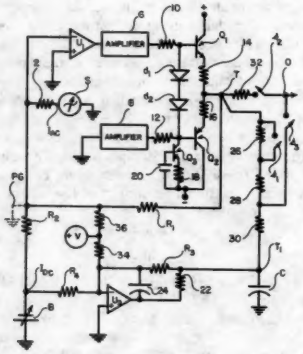
a peak detector coupled between the output of the variable comparator and the control input of the variable attenuator and responsive to the variably attenuated electrical pulses for producing a control signal coupled to the control input of the variable attenuator when the level of the variably attenuated electrical pulses are higher than a particular peak level for the peak detector and with the particular threshold level for the threshold comparator less than the particular peak level for the peak detector.

4,620,108

MEANS PROVIDING INDEPENDENTLY CONTROLLED SUPERIMPOSED AC AND DC VOLTAGES

Robert J. Bland, Berkeley Heights, N.J., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jun. 4, 1985, Ser. No. 740,948
Int. Cl.[4] H02J 5/00
U.S. Cl. 307—2 **2 Claims**



1. A circuit for providing independently controllable AC and DC voltages comprising,

a first input terminal to which an AC voltage may be applied,

a second input terminal to which a DC voltage may be applied,

a first output terminal, first amplifying means coupled between said first and second input terminals and said first output terminal,

a second output terminal,

a capacitor connected between said second output terminal and a point of reference potential,

voltage dividing means coupled between said first and second output terminals,

second amplifying means coupled between said second input terminal and said second output terminal,

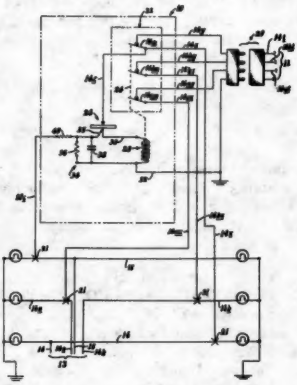
said first and second amplifying means having the same gain for DC voltage.

4,620,109

BOAT TRAILER LIGHT DE-ENERGIZATION MEANS

Robert F. Kummer, 2507 George St., Logansport, Ind. 46947

Filed May 6, 1985, Ser. No. 730,863
Int. Cl.[4] H02G 3/00
U.S. Cl. 307—10 LS **5 Claims**



1. A control means including control circuitry therefor, which prevents short circuit conditions of a boat trailer's light-circuitry at the boat-launch site, the means and control circuitry comprising, in combination:

at least two co-ordinated control circuits,

a first one of the control circuits being provided to a branch of the vehicle's backup lights' circuitry, utilizing the fact of the boat-launch and retrieval maneuver of the towing vehicle normally including a reverse-drive action of the towing vehicle, thereby assuring energizing of that first control circuit,

another of the control circuitry being provided as a branch of another of the towing vehicle's circuitry,

and a control module including switches for opening the boat trailer light-circuitry,

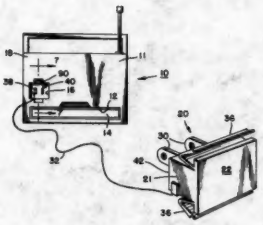
the control means providing that for its said operativity both those control circuits must be energized simultaneously, thus minimizing chances of inadvertent de-activation of the trailer's light-circuitry when needed for highway use.

4,620,110

COMPACT POWER SUPPLY MODULE AND CORD

Robert W. Cooney, Marcy, N.Y., assignor to General Electric Company, Portsmouth, Va.

Filed Jul. 15, 1985, Ser. No. 755,115
Int. Cl.[4] H02J 7/00
U.S. Cl. 307—48 14 Claims



1. In a product having a primary housing and an electrical load therein adapted for selective energization from first and second sources of direct current electric power, said first source comprising battery means received within said primary housing and said secondary source comprising means for converting relatively high voltage alternating current to relatively low voltage direct current, the improvement comprising:

a secondary housing containing at least all of the high voltage components of said second source including terminal means for connection to an external source of alternating current electric power,

a recess within said primary housing accessible from the exterior of said primary housing,

a relatively low bulk, low voltage electrical conductor interconnecting said secondary housing and said product through said recess for supplying low voltage electric power to said product from said secondary housing,

said recess within said primary housing being configured and sized to receive both said secondary housing and said electrical conductor for storage therein when the product is not being energized from said second source, the low bulk of said low voltage electrical conductor permitting the size of said recess to be minimized,

and latching means for releasably securing said secondary housing and said electrical conductor within said recess.

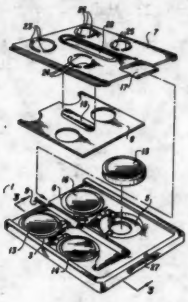
4,620,111

AUXILIARY PORTABLE POWER SUPPLY

William J. McArthur, Maple Grove, and Glenn W. Merry, St. Paul, both of Minn., assignors to Duracell Inc., Bethel, Conn.

Filed Jun. 25, 1984, Ser. No. 624,450
Int. Cl.[4] H01M 2/00
U.S. Cl. 307—150 9 Claims

1. A lightweight auxiliary power supply apparatus comprising a housing member having a plurality of wells, each of said wells being adapted to receive at least one disk shaped zinc air button cell; switch means, connected to said housing, comprising a slideably mounted member, to control the flow of oxygen to each of the cells; and electrical connecting means, connected to said housing, to suitably connect said apparatus to a battery operated appliance.

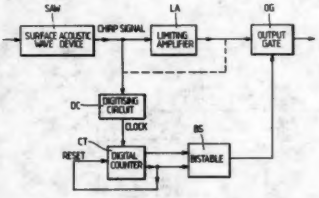


4,620,112

CHIRP SIGNAL GATING CIRCUIT FOR EXPANDER IN A PULSE COMPRESSION RADAR SYSTEM

Hugh McPherson, Tweeddale, and John P. Blakely, Edinburgh, both of Scotland, assignors to FERRANTI plc, Cheshire, England

Filed Oct. 6, 1983, Ser. No. 539,559
Claims priority, application United Kingdom, Oct. 16, 1982, 8229618
Int. Cl.[4] H03K 17/56, 17/29, 21/09
U.S. Cl. 307—239 4 Claims



1. A gating circuit for an expander in a pulse compression radar system which includes a surface acoustic wave delay line responsive to an input pulse to generate a frequency-modulated radio-frequency output signal, said gating circuit comprising:

a gate having an input to which the output signal from the delay line is applied;

means responsive to the output signal from the delay line for generating a digital pulse corresponding to each cycle of the output signal;

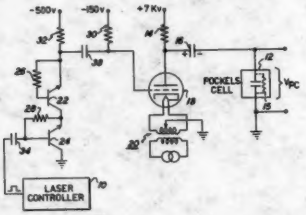
a digital counter operable to count the digital pulses and hvaing at least first and second predetermined counter states; and

control means connected to said digital counter and to said gate, said control means being responsive to the first predetermined counter state to open said gate, and responsive to the second predetermined counter state to close said gate.

4,620,113
POCKELS CELL DRIVER

Theodore Sizer, II; Irl N. Duling, III, both of Rochester; Carl H. Petras, Cameron, and Samuel A. Letzring, Honeoye Falls, all of N.Y., assignors to The University of Rochester, Rochester, N.Y.

Filed Feb. 17, 1984, Ser. No. 581,144
Int. Cl.[4] H03K 3/26, 3/86; H02B 5/30
U.S. Cl. 307—270 15 Claims

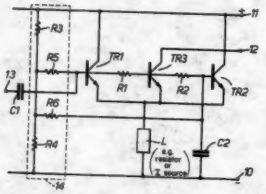


1. A Pockels cell driver which comprises a vacuum tube having a cathode, a grid and an anode, a resistor connecting said anode to a source of voltage at least as high as the half wavelength voltage of the Pockels cell, a storage capacitor connecting the anode to one end of the Pockels cell, means connecting the other end of the Pockels cell to the cathode of said tube, and means connected to the grid of said tube for switching said tube into conduction for a period of time sufficient to discharge said storage capacitor and to charge the capacitance presented by the Pockels cell to increase the voltage across the Pockels cell at least to the half wavelength voltage thereof.

4,620,114
SIGNAL STRENGTH DETECTOR

Philip A. K. Moon, Wiltshire, England, assignor to Plessey Overseas Limited, Ilford, England

Filed Aug. 31, 1984, Ser. No. 646,113
Claims priority, application United Kingdom, Sep. 1, 1983, 8323487
Int. Cl.[4] H03K 5/24; G01R 19/165
U.S. Cl. 307—350 16 Claims

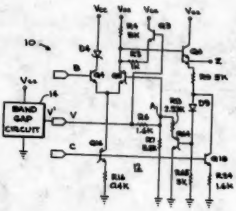


1. A signal strength detector, comprising: first, second and third transistors of the same conductivity type, each having an emitter electrode, a collector electrode and a base electrode; a pair of dc supply lines, the emitter electrode of each transistor being connected together and coupled to one of the pair of dc supply lines via a constant current source, and the collector electrodes of the first and second transistors each being coupled with the other of the pair of dc supply lines; a first resistor through which the base electrode of the first transistor is coupled to the base electrode of the third transistor; and a second resistor through which the base electrode of the second transistor is coupled to the base electrode of the third transistor, wherein the collector electrode of the third transistor is effective to provide a source of output current which is representative of a differential signal level between the base electrodes of the first and second transistors.

4,620,115
VOLTAGE-TEMPERATURE COMPENSATED THRESHOLD FOR HYSTERESIS LINE RECEIVER AT TTL SUPPLY VOLTAGE

Gil S. Lee, and A. Ram Subramaniam, both of San Jose, Calif., assignors to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Sep. 7, 1984, Ser. No. 648,843
Int. Cl.[4] H03K 17/16, 19/086
U.S. Cl. 307—443 17 Claims



1. A line receiver circuit having an input hysteresis characteristic which is compensated for both temperature changes and variations in supply voltage with a single transistor-transistor logic compatible power supply, said receiver circuit comprising:

a receiver circuit portion including a first reference transistor and a second reference transistor, said first reference transistor having its base connected to an input circuit terminal for receiving a logic signal, its collector coupled to a supply voltage potential via a Schottky diode and its emitter coupled to the emitter of said second reference transistor, said second reference transistor having its base connected to a threshold voltage node and its collector connected to the voltage potential via a load resistor;

said receiver circuit portion further including a multi-emitter output transistor having first and second emitters, said output transistor having its base connected to the collector of said second reference transistor, its collector to the voltage potential and its first emitter connected to an output circuit terminal;

a first voltage divider network formed of a first resistor and a second resistor, one end of the first resistor being connected to one end of the second resistor and to the threshold voltage node, the other end of the first resistor being connected to receive a constant reference voltage, the other end of the second resistor being connected to a ground potential;

a second voltage divider network formed of the first resistor and a third resistor, one end of the third resistor being connected to the common connection of the first and second resistors and threshold voltage node; and

a feedback switching transistor having its base coupled to the second emitter of said output transistor, its collector connected to the other end of the third resistor and its emitter connected to the ground potential.

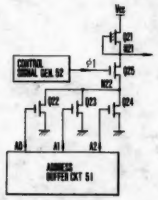
4,620,116
DECODER CIRCUIT WITH SETTING FUNCTION OF AN OUTPUT LEVEL

Takashi Ozawa, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Oct. 25, 1983, Ser. No. 545,293
Claims priority, application Japan, Oct. 27, 1982, 57-188711
Int. Cl.[4] H03K 19/094
U.S. Cl. 307—449 4 Claims

1. A decoder circuit comprising a first voltage terminal, a second voltage terminal, and an output terminal; a first field effect transistor having a drain-source path coupled between said first voltage terminal and said output terminal, a second field effect transistor having one of a drain and a source cou-

pled to said output terminal, a plurality of third field effect transistors having gates receiving input signals, drain-source paths of said third transistors being coupled between the other of the drain and source of said second transistor and second voltage terminal, control means for continuously rendering said second transistor conductive in a first operating mode and



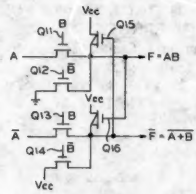
rendering said second transistor non-conductive in a second operation mode, and means for enabling said first transistor in both of said first and second operating modes, wherein a level of said output terminal is determined by said input signals in said first operating mode while a level of said output terminal is set at the level of said first voltage terminal irrespective of said input signals in said second operating mode.

4,620,117

BALANCED CMOS LOGIC CIRCUITS

Sheng Fang, San Antonio, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jan. 4, 1985, Ser. No. 688,781
Int. Cl.[4] H03K *19/094, 19/20, 19/21, 19/017*
U.S. Cl. 307—451 **10 Claims**



4. A balanced CMOS AND logic gate circuit comprising:

a first pair of N-channel type MOS transistors formed of first and second transistors whose drains are connected together;

a second pair of N-channel type MOS transistors formed of third and fourth MOS transistors whose drains are connected together;

a supply potential being connected to the source of said fourth transistor;

a ground potential being connected to the source of said second transistor;

a first true input signal being applied via a first input terminal to the source of said first transistor;

a complement of said first input signal being applied via a second input terminal to the source of said third transistor;

a second true input signal being applied via a third input terminal to the gates of said first and third transistors;

a second complement of said second input signal being applied via a fourth input terminal to the gates of said second and fourth transistors;

a pair of cross-coupled P-channel type MOS transistors formed of fifth and sixth transistors whose sources are coupled to the supply potential, the gate of said fifth transistor being connected to the drain of said sixth transistor and the gate of said sixth transistor being connected to the drain of said fifth transistor;

the drain of said fifth transistor being further connected to the drains of said first and second transistors and to a true output terminal; and

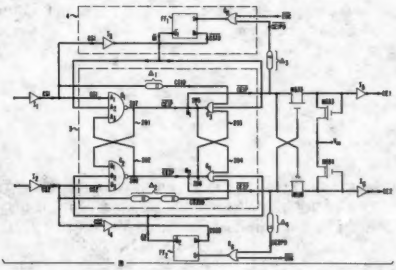
the drain of said sixth transistor being further connected to the drains of said third and fourth transistors and to a complement output terminal.

4,620,118

DUAL PORT ACCESS CIRCUIT WITH AUTOMATIC ASYNCHRONOUS CONTENTION RESOLVING CAPABILITY

Frank E. Barber, Center Valley, Pa., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Oct. 1, 1982, Ser. No. 432,289
Int. Cl.[4] H03K *17/28, 5/26*
U.S. Cl. 307—518 **32 Claims**



1. A circuit for producing a pair of contention resolved output signals from first and second conflicting access request signals comprising:

(a) first and second cross-coupled, triple input main combinational logic elements each having an input terminal that is separately connected for receiving the first and second request signals, respectively;

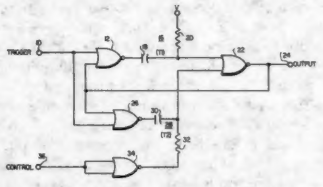
(b) first and second bistable logic elements each respectively connected for delivering to another separate input terminal of the first and second main logic elements, respectively, first and second priority status signals representative of the instantaneous priority of access status of the access request signals.

4,620,119

DUAL-MODE TIMER CIRCUIT

Gregory A. Williams, Elk Grove Village, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 6, 1984, Ser. No. 638,090
Int. Cl.[4] H03K *17/28, 5/159*
U.S. Cl. 307—595 **4 Claims**



1. A timer having an input terminal and an output terminal and operable for selectively generating an output signal of two

different durations at said output terminal in response to a trigger pulse at said input terminal comprising:

output means comprising a two-input logic gate coupled to the output terminal for generating an output signal;

a first RC network timing circuit coupled between said input terminal and one of the inputs of said logic gate;

a second RC network timing circuit, having a timing duration different from said first timing circuit, coupled between said input terminal and the other input of said logic gate;

control means for selectively rendering said first and said second timing circuits effective to change the duration of the output signal generated by said output means, said control means controlling activation of the one of said RC networks having the shorter time constant, said RC networks being charged in parallel and the one having the shorter time constant controlling said output means; and

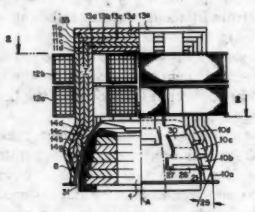
further including second and third two-input logic gates, each having one input supplied with said trigger pulse, another input connected to said output terminal and outputs respectively connected to said first and said second RC network timing circuits.

4,620,120

STATOR HAVING TOOTH LAMINATION STRIPS LYING BETWEEN CIRCULAR CYLINDERS

Karsten Laing, 632 Marsat Ct., Chula Vista, Calif. 92011

Filed Nov. 2, 1984, Ser. No. 667,793
Int. Cl.[4] H02K *17/00*
U.S. Cl. 310—166 **6 Claims**



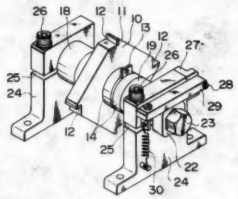
1. A stator for an electric motor having a rotating rotor with axis of rotation of which the gap running between the rotating rotor and the stator for the magnetic flux lies on a spherical surface, and in which the stator exhibits teeth which extend axially and are built, up from tooth lamination strips which pierce windings running in planes of rotation and are connected together in magnetic conductivity via a yoke at the axial end remote from the rotor, where pole shoes are provided through which the clearance between two teeth adjacent in the circumferential direction at the axial end next the rotor is reduced down to a narrow gap, characterized in that an area of the tooth lamination strips (**11***a* to **11***d*) next the rotor (**1**) has shoes (**10***a* to **10***d*) formed thereon which follow the spherical surface so that said shoes form groups of shoes (**10** and **20**) lying side by side and in the circumferential direction only a narrow gap (**21**) remains between adjacent groups of shoes, each of said shoes (**10***a* to **10***d*) forming with one of said tooth lamination strip (**11***a* to **11***d*) a single unit, where regions (**14***a* to **14***d*) of the tooth lamination strips (**11***a* to **11***d*) extending between windings (**12***a*, **12***b*) and the shoes (**10***a* to **10***d*) run along curves one above the other about the axis (A) of the rotor.

4,620,121

PIEZOELECTRIC APPARATUS FOR ACTIVATING SQUARE PLATE RESONATOR

Shoji Mishiro, Kawasaki, Japan, assignor to Taga Electric Company, Limited, Tokyo, Japan

Filed Dec. 3, 1985, Ser. No. 804,150
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—323 **4 Claims**



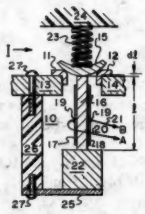
1. An apparatus for activating a square plate resonator, comprising annular electrostriction elements each having on one side thereof four segmental electrodes divided circumferentially and polarized in such a manner that every adjacent electrodes have mutually reverse polarities in the direction of thickness, said annular electrostriction elements being so disposed that the center lines of division become positionally coincident with the diagonal lines of said square plate resonator while passing through the surface center point thereof, wherein said annular electrostriction elements and said square plate resonator are clamped together by columnar blocks supported securely by means of bearing members.

4,620,122

PIEZOELECTRIC CONTACT DRIVER FOR CIRCUIT INTERRUPTERS

Edward K. Howell, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Jul. 29, 1985, Ser. No. 759,710
Int. Cl.[4] H01L *41/08*
U.S. Cl. 310—328 **1 Claim**



1. A contact arrangement for interrupting circuit current comprising:

a pair of fixed contacts for connection within an electric circuit;

a bridging contact arranged across said fixed contacts for transport of circuit current between said fixed contacts;

a contact driver arranged to exert a force between said fixed contacts and said bridging contact, said contact driver comprising voltage responsive means whereby a voltage pulse applied to said contact driver moves said bridging contact away from said fixed contacts to interrupt said current, said contact driver comprising a piezoelectric bar having a pair of electrodes attached to either side of said bar, said bridging contact abutting one end of said piezoelectric bar, and a block abutting an opposite end of said

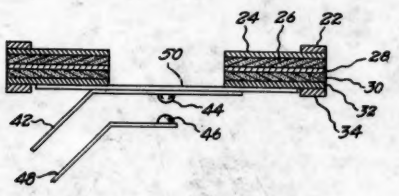
piezoelectric bar, the mass of said block being greater than the mass of said contact for enhancing motion of said contact relative to said block, said block being attached to an insulating support arranged parallel to said piezoelectric bar, said block being attached to said insulating support by means of a cantilever spring.

4,620,123

SYNCHRONOUSLY OPERABLE ELECTRICAL CURRENT SWITCHING APPARATUS HAVING MULTIPLE CIRCUIT SWITCHING CAPABILITY AND/OR REDUCED CONTACT RESISTANCE

George A. Farrall, Rexford, and John H. Van Noy, Ballston, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,882
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—331 7 Claims



1. An electrical current switching apparatus comprising:

a plurality of subtantially coplanar, flat piezoelectric benders of the type having at least two electrically conductive layers separated by a piezoelectric material and exhibiting bending motion in response to an electrical signal, said bending motion being in a direction substantially perpendicular to the plane in which said benders lie;

each of said benders being fixed at a first end;

an electrically insulating linking member attached between the moving ends of at least two of said piezoelectric benders;

at least one pair of electrical current switching contacts, at least one of said contacts being movable and located substantially centrally on said linking member so that said bending motion of said piezoelectric benders causes corresponding movement of said movable contact, said contacts being disposed so that said movement of said movable contact produces a change in the relative position of said pair of contacts between open and closed positions;

a common electrical conductor electrically connecting a first one of said electrically conductive layers of each of said piezoelectric benders to said electrical signal; and

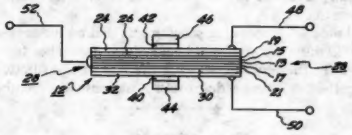
means for electrically connecting a second one of said electrically conductive layers of said piezoelectric benders to said electrical signal so that said benders exhibit said bending motion in response to said signal.

4,620,124

SYNCHRONOUSLY OPERABLE ELECTRICAL CURRENT SWITCHING APPARATUS HAVING INCREASED CONTACT SEPARATION IN THE OPEN POSITION AND INCREASED CONTACT CLOSING FORCE IN THE CLOSED POSITION

George A. Farrall, Rexford, and John H. Van Noy, Ballston, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Dec. 21, 1984, Ser. No. 684,880
Int. Cl.[4] H01L 41/08
U.S. Cl. 310—332 12 Claims



1. A piezoelectrically actuated electrical current switching apparatus, comprising:

a pair of spaced-apart opposing multimorph piezoelectric benders, each of said benders being of the type exhibiting bending motion in a direction substantially perpendicular to the plane in which said bender lies in response to a first electrical signal and bending motion in the opposite direction in response to a second electrical signal;

each of said benders being fixed at a pair of opposing ends such that said bending motion comprises bowing proximate the center thereof; and

at least one pair of electrical current switching contacts, one of said contacts of said pair being centrally mounted on one of the opposing surfaces of said pair of opposing benders and the second contact of said pair being centrally mounted on the second one of said opposing surfaces;

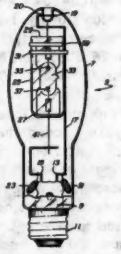
said pair of contacts and said piezoelectric benders being disposed so that in response to said first electrical signal said opposing benders bow toward each other and move said contacts to a closed position and so that in response to said second electrical signal said opposing benders bow away from each other and move said contacts to an open position.

4,620,125

LOW WATTAGE METAL HALIDE LAMP WITH INVERTED DOMED SLEEVE

William M. Keeffe, Rockport; Zeya K. Krasko, Danvers, both of Mass., and Robert J. Karlotski, Weare, N.H., assignors to GTE Products Corporation, Stamford, Conn.

Filed Oct. 29, 1984, Ser. No. 665,472
Int. Cl.[4] H01J 61/04, 61/18, 61/34
U.S. Cl. 313—25 8 Claims



1. A metal halide discharge lamp comprising:

an arc tube having a chemical fill including a sodium halide,

an electrode therein at each end thereof and an outer strap member affixed thereto;

a heat reducing member in the form of a sleeve having a domed end and an open end with an outer metal band affixed thereto, said sleeve surrounding said arc tube;

an evacuated outer envelope surrounding said heat reducing member, said envelope having a pair of electrical conductors sealed therein and passing therethrough and at least one getter at one end therein;

said outer strap member, one of said electrodes of said arc tube and said outer metal strap of said heat reducing member electrically coupled to one of said pair of electrical conductors and the other electrode of said arc tube electrically coupled to the other one of said pair of electrical conductors;

and means for reducing sodium loss that includes positioning said domed end of said heat reducing member toward said getter thereby interrupting the line-of-sight between said getter and the inside of said heat reducing member.

4,620,126

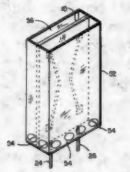
HIGH ENERGY DISCHARGE SPARKGAP

Hans E. Manske, Addison, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jun. 28, 1984, Ser. No. 625,401

Int. Cl.[4] H02H *1/04*

U.S. Cl. 313—325 **3 Claims**



1. A spark gap for use in a television receiver or the like comprising:

an insulating high temperature substrate defining a plurality of support apertures;

a pair of divergent wires rigidly mounted to said substrate by means of said support apertures;

means for plug-in mounting of said substrate in an upright position with the diverged ends of said wires uppermost; and

a flameproof housing surrounding said substrate, said housing including a ventilation opening near the bottom thereof and being substantially open at the top thereof for providing a chimney effect.

4,620,127

KINESCOPE-YOKE ASSEMBLY

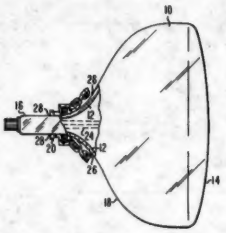
Kwong T. Chung, Hopewell Township, Mercer County, and Alfred R. Triano, Union County, both of N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Feb. 26, 1985, Ser. No. 705,649

Int. Cl.[4] H01J *29/70*

U.S. Cl. 313—440 **9 Claims**

1. An assembly comprising a kinescope and an external magnetic deflection yoke bonded thereto with an adhesive comprising: a polymer matrix comprising from about 40 to about 50 percent by weight of an isocyanate component, from about 40 to about 50 percent by weight of a polyol component comprising one or more polyols having an average functionality greater than 2.0 and an average hydroxyl equivalent of from about 2000 to about 2500, from about 2.8 to about 5 percent by weight of a suitable chain extender, from 0 to about 2.5 percent by weight of one or more catalysts for isocyanate/-hydroxyl reactions; and one or more suitable fillers selected from the group consisting of inorganic fillers, organic fillers and mixtures thereof, said fillers comprising from about 32 to about 60 percent by volume of the adhesive, with the proviso



that when the claim extender is a diol the functionality thereof is included in said polyol component functionality average.

4,620,128

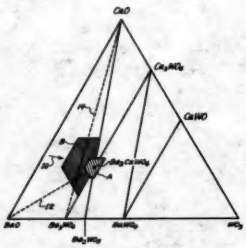
TUNGSTEN LADEN EMISSION MIX OF IMPROVED STABILITY

Krishan L. Luthra, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,352

Int. Cl.[4] H01J *17/04*

U.S. Cl. 313—630 **8 Claims**



1. As an emission mix for a sodium vapor lamp the composition corresponding to points within the shaped areas A and B of the triaxial plot of FIG. 3 multiphase compositions derived from CaO, BaO and WO_3, said mix having a quantity of finely divided tungsten metal dispersed therein.

4,620,129

GETTERED HIGH PRESSURE SODIUM LAMP

Krishan L. Luthra, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Apr. 29, 1985, Ser. No. 728,556

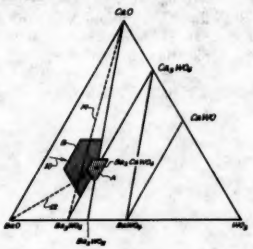
Int. Cl.[4] H01J *17/04*

U.S. Cl. 313—630 **7 Claims**

1. As an emission mix for a HPS or DHPS sodium vapor lamp,

the composition corresponding to points within the shaped areas A and B of the triaxial plot of FIG. 3 multiphase compositions derived from CaO, BaO and WO_3, said

composition containing a small percentage of an oxygen getter metal which is solid at the operating temperature,



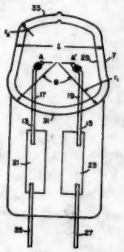
above 1200° C., of the emission material of the sodium vapor lamp.

4,620,130

ELECTRODE ALIGNMENT AND CAPSULE DESIGN FOR SINGLE-ENDED LOW WATTAGE METAL HALIDE LAMPS

William M. Keeffe, Rockport; W. Calvin Gungle, Danvers; Harold L. Rothwell, Jr., Rowley, and Zeya K. Krasko, Danvers, all of Mass., assignors to GTE Products Corporation, Stamford, Conn.

Filed Mar. 27, 1984, Ser. No. 593,790
Int. Cl.[4] H01J *61/33, 61/04*
U.S. Cl. 313—634 8 Claims



1. A single-ended low wattage metal halide arc discharge lamp comprising:

an isothermal arc chamber having an outer diameter, a dome seal portion and an inner press seal portion;

a fill gas disposed within said arc chamber which includes mercury, a halide and a starting gas;

a pair of electrical conductors sealed into and passing through one end of said arc chamber to provide a pair of electrodes therein, said arc discharge lamp characterized by the improvement wherein said arc chamber has a diameter as determined in accordance with the following:

$$t=aW+b$$

where:

t=arc chamber outer diameter

w=lamp wattage

a=0.07±0.01 mm/watt

b=7.20±1.00 mm

and wherein said press seal portion has a radius (r_1) whereat:

$$r_1=t/2+c$$

where:

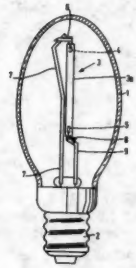
$c=1.4\pm0.2$ *mm.*

4,620,131

LAMP WITH DISCHARGE VESSEL MADE OF DENSELY SINTERED TRANSLUCENT ALUMINIUM OXIDE

Peter R. Prud'homme van Reine, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 9, 1984, Ser. No. 629,140
Claims priority, application Netherlands, Jul. 25, 1983, 8302638
Int. Cl.[4] H01J *17/16, 61/30*
U.S. Cl. 313—636 4 Claims



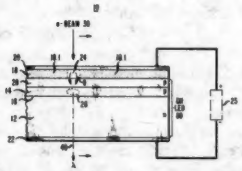
1. A lamp comprising a discharge vessel provided with a wall of densely sintered translucent aluminum oxide formed for the major part from crystals having a size of at most 60 μm. characterized in that at least 50% of the inner surface is formed from a first group of crystals having a maximum dimension larger than 60 μm and smaller than 300 μm, the remainder of said crystals having a grain size different from said first group of crystals, which crystal size distribution extends over a layer thickness of one crystal that provide high resistivity to corrosive attack.

4,620,132

ELECTRON BEAM SCANNABLE LED DISPLAY DEVICE

Eugene I. Gordon, Convent Station, and Uri Levy, Berkeley Heights, both of N.J., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Apr. 1, 1983, Ser. No. 481,470
Int. Cl.[4] H01J *23/16, 29/96*
U.S. Cl. 315—3 15 Claims



1. A CRT device comprising

a semiconductor target, and

a source of a scannable e-beam for addressing said target, characterized in that said target includes

a p-n junction which produces charge flow and radiative recombination when forward biased, and

at least one current-blocking layer which inhibits charge flow across said junction in the absence of said e-beam being incident on said layer,

said e-beam being absorbed in a localized zone of said layer

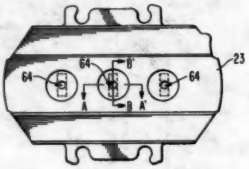
so as to allow charge flow therethrough, thereby generating from said recombination a light spot which radiates from said target and which scans with said e-beam.

4,620,133

COLOR IMAGE DISPLAY SYSTEMS

Albert M. Morrell; Richard H. Hughes, both of Lancaster, Pa., and William H. Barkow, Pensauken, N.J., assignors to RCA Corporation, Princeton, N.J.

Filed Jan. 29, 1982, Ser. No. 343,734
Int. Cl.[4] H01J *29/46, 29/56*
U.S. Cl. 315—15 25 Claims



1. A color image display system comprising:

a color picture tube including an evacuated envelope comprising a screen portion enclosing a display screen, a cylindrical neck portion, and a funnel portion connecting said screen portion and said neck portion;

an electron gun assembly, mounted within said neck portion, for producing three in-line electron beams;

a compact deflection yoke assembly encircling adjoining segments of said neck and funnel portions for developing deflection fields which permit tracing of display rasters on said screen with substantial convergence of said beams throughout the display, and which establish a given deflection angle between beam paths which terminate at diagonally opposed raster corners, said yoke assembly including horizontal deflection windings of saddle configuration defining respective windows, and vertical deflection windings of toroidal configuration, establishing respective deflection centers for said beams within the encircled region of said envelope;

said gun assembly including two main focusing electrodes at the beam exit end of said gun assembly maintained at different potentials, each of said main focusing electrodes including: a portion disposed transversely with respect to the longitudinal axis of said neck and having a trio of in-line apertures, through each of which a respectively different one of said beams passes; and an adjoining portion extending longitudinally therefrom and providing a common enclosure for the paths of all of said beams, the respective adjoining portions of said electrodes being juxtaposed to define therebetween a common main focusing lens for said beams from which said beam paths depart in converging fashion;

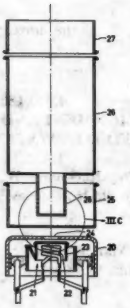
wherein the center-to-center spacing between adjacent apertures of each of said trios is such as to restrict the center-to-center spacing of adjacent ones of said beams to less than 200 mils in transverse planes occupied by said delfection centers, wherein the configurations of said juxtaposed portions establish a major transverse dimension for said main focusing lens of significantly more than three times said center-to-center spacing between adjacent apertures, wherein the diameter of said neck portion is sufficiently great that the interior surface of said neck portion is spaced from the outer surfaces of said juxtaposed enclosures, and wherein the internal diameter of said compact yoke assembly at the beam exit end of said windows totals less than 30 mils per degree of said deflection angle.

4,620,134

CATHODE-RAY TUBE

Antonius H. P. M. Peels; Antonius J. M. van den Beld; Jan Bijma, and Jan Gerritsen, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 21, 1983, Ser. No. 544,169
Claims priority, application Netherlands, Oct. 29, 1982, 8204185
Int. Cl.[4] H01J *29/46, 29/56*
U.S. Cl. 315—15 5 Claims



1. A cathode-ray tube comprising an envelope containing a luminescent screen and an electron gun for producing an electron beam propagating along a longitudinal axis of the tube to the screen, said electron gun including, in order along the direction of propagation of the electron beam, a plurality of electrodes having respective electron-beam-passing apertures including:

(a) a control gate and a first lens electrode defining, during operation, a first lens for forming the electron beam into a crossover;

(b) a second lens electrode which together with the first lens electrode defines, during operation, a second lens for accelerating the electron beam and pre-focusing the electron beam crossover; and

(c) at least a third lens electrode which together with the second lens electrode defines during operation, a third lens for focusing the electron beam crossover into a spot on the screen;

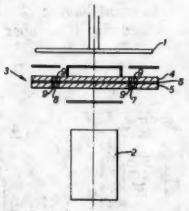
characterized in that said first and second lens electrodes are spaced apart and have their respective apertures centered on the axis, the aperture in the second lens electrode having a diameter smaller than twice that of the first lens electrode, and the effective spacing S-eff between said first and second lens electrodes being smaller than 1 mm., S-eff being defined as the minimum of the function $-\Delta V/E(z)$, where ΔV is the difference between predefined operating voltages of the first and second lens electrodes, and where E(z) is the electrical field strength on the axis between the first and second lens electrodes as a function of the distance z along the axis, the effective spacing S-eff being larger than the geometrical spacing between the first and second lens electrodes.

4,620,135

ELECTRIC CIRCUIT INTERRUPTING DEVICES

Timothy P. Donaldson, Great Totham; Raymond P. Knight, Braintree, and John R. Shepheard, Great Baddow, all of England, assignors to English Electric Valve Company Limited, Chelmsford, England

Filed Oct. 25, 1983, Ser. No. 545,272
Claims priority, application United Kingdom, Oct. 27, 1982, 8230695
Int. Cl.[4] H01J 17/44
U.S. Cl. 315—326 12 Claims



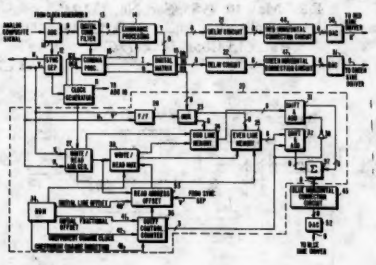
1. A thyratron including at least one apertured control grid disposed between an anode and a cathode, with said apertured control grid being divided transversely into two electrically insulated parts which are separated by a layer of insulating material and which have a spacing one from the other in the region of an aperture through said two parts which is less than the Debye length of that region, and with said aperture or apertures of each said part of said grid being so dimensioned that no point within said aperture or apertures is further from one or the other of said two parts than the aforementioned Debye length.

4,620,136

DIGITAL VERTICAL BEAM LANDING CORRECTION CIRCUIT

Thomas V. Bolger, Merchantville, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Nov. 29, 1984, Ser. No. 676,141
Int. Cl.[4] H01J 29/56
U.S. Cl. 315—371 6 Claims



1. Apparatus for correcting a vertical beam landing position error in a cathode ray tube for a video information pixel comprising:

means for providing the correct vertical raster location for said video information pixel;

means responsive to said location providing means for providing a first amount of vertical beam landing position error correction for said video information pixel equal to the number of integer video scan lines of correction required;

means for digitally sampling first and second lines of video information to provide a plurality of sample pixels from each of said first and second lines of video information;

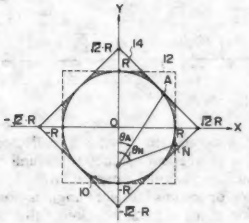
means responsive to said location providing means for combining sample pixels from said first and said second lines of video information to provide a second amount of vertical beam landing position error correction for said video information pixel equal to the fractional line amount of correction required.

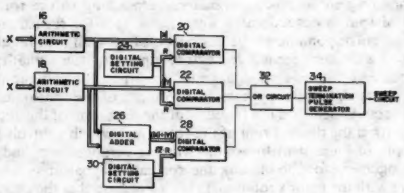
4,620,137

SWEEP TERMINATION SIGNAL GENERATING APPARATUS FOR RADAR SYSTEM

Yoshio Numaho; Yoshio Kato, both of Tokyo; Hiroshi Okada, Chiba, and Tetsuro Ogawa, Tokyo, all of Japan, assignors to Tokyo Keiki Company, Ltd., Tokyo, Japan

Filed Jul. 19, 1983, Ser. No. 515,253
Claims priority, application Japan, Jul. 21, 1982, 57-127408
Int. Cl.[4] H01J 29/78; G01S 7/14
U.S. Cl. 315—378 4 Claims





1. In a sweep termination signal generating apparatus for a radar system displaying a radar image through sweeping of an electron beam on a circular CRT screen in accordance with a PPI system, the improvement comprising:

a coordinate position calculating means for outputting a deflection position of said electron beam varying with a variation of an antenna rotation angle in the form of a coordinate position (X,Y) in rectangular coordinates having a central point of said circular CRT screen as a coordinate origin; and

a sweep termination signal generating means for outputting a sweep termination signal which commands a termination of a sweep signal for deflection of said electron beam when one of the following conditions is satisfied:

(1) an absolute value |X| of X of said coordinate position (X,Y) outputted from said coordinate position calculating means is larger than a display radius R of said circular CRT screen;

(2) an absolute value |Y| of Y of said coordinate position X,Y is larger than said display radius R; and

(3) a sum of said absolute values $|X|+|Y|$ is larger than value obtained by multiplying said display radius R by $\sqrt{2}$;

whereby said sweeping is terminated when said electron beam reaches a display boundary of a circumference of said circular CRT screen irrespective of whether a sweep

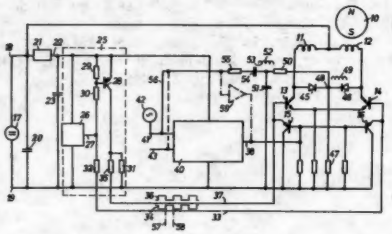
center is said central point of said circular CRT screen or is an off-center point.

4,620,138

DRIVE ARRANGEMENT WITH COLLECTORLESS D.C. MOTOR

Rolf Müller, St. Georgen, Fed. Rep. of Germany, assignor to Papst-Motoren GmbH & Co. KG, St. Georgen, Fed. Rep. of Germany

Filed Mar. 21, 1985, Ser. No. 714,220
Int. Cl.[4] H02P *6/02*
U.S. Cl. 318—254 **7 Claims**



1. Drive arrangement having a collectorless d.c. motor comprising a permanent-magnet rotor and a stator winding arrangement; an angular-position transducer arrangement which during operation furnishes angular-position signals that are a function of the angular position of the rotor; an electrical commutation arrangement which receives the angular-position signals and selectively connects the stator winding arrangement to a current source; an rpm-measuring arrangement for generating an actual-rpm signal corresponding to the rotor's actual rpm; a desired-value signal generator for furnishing a signal corresponding to the desired rotor rpm; an rpm-regulating arrangement having respective inputs for the actual-rpm signal and desired-rpm signal and an output, for generating a regulator signal that appears at the output of the rpm-regulating arrangement and is a function of the deviation of the actual rpm from the desired rpm of the rotor, and which controls the supply of current to the stator winding arrangement; and an arrangement for modulating the regulator signal in synchronism with the rotor's rotation, in such a fashion that the current flowing in the stator winding arrangement between each two successive commutation operations initially builds up beginning at a point in time at least approximately coinciding with the point in time at which the commutation occurs, and then drops off again until a point in time at least approximately coinciding with the point in time at which the next-following commutation occurs.

4,620,139

BRUSHLESS D.C. MOTOR

Kazuhito Egami, Tokyo, and Norimitsu Hirano, Kanagawa, both of Japan, assignors to Kabushiki Kaisha Shicoh Giken, Kanagawa, Japan

Filed Jul. 22, 1985, Ser. No. 757,172
Int. Cl.[4] H02K *29/08*
U.S. Cl. 318—254 **4 Claims**

1. A brushless d.c. motor comprising:

(a) a flat annular rotor magnet secured on a rotary magnetic yoke, said rotor magnet being endless and having 2p contiguous poles of alternating N and S polarity, where p is an integer of at least 1, said poles defining equal areas, having a predetermined width, of non-skewed magnetization;

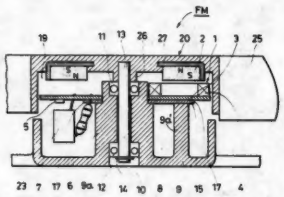
(b) a stator yoke disposed in a face-to-face relation with said rotor magnet in an axial direction;

(c) an air-gap and a printed circuit member positioned between said rotor magnet and said stator yoke;

(d) at least one armature coil of the air-core type arranged on said printed circuit facing said rotor magnet, said armature coil having a sectorial shape and conductor portions contributing to generation of torque, said conductor portions defining an opening angle having a width substantially equal to the width of each of said poles of said rotor magnet;

(e) means for detecting one of the N and S poles of the rotor magnet and causing electric current to flow in a predetermined direction in said armature coil, said detecting means comprising a sole position sensor arranged along one of a said conductor portion of said armature coil and an in-phase position relative to a said conductor portion;

(f) a power control circuit having electrical elements arranged on said printed circuit member;



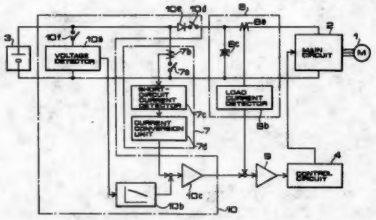
(g) means for orienting said rotary magnetic yoke such that, when no electric current is caused to flow in said armature coil, the areas of the stator yoke opposite to the N magnetic poles of the rotor magnet are substantially equal to the areas of the stator yoke opposite to the S magnetic poles of the rotor magnet, and, when no power is fed to the motor, the central axis which divides the stator yoke in two is located at a point approximately one-fourth of the width of each magnetic pole of the rotor magnet behind, relative to the direction of rotation of said rotor magnet, a point opposite to a said conductor portion of the armature coil which contributes to the generation of torque, said orienting means comprising a cut-off portion of predetermined shape in said stator yoke.

4,620,140

CONTROL DEVICE FOR VARIABLE SPEED ELECTRIC MOTOR

Katsuhiko Chonan, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1985, Ser. No. 732,719
Claims priority, application Japan, May 11, 1984, 59-92923
Int. Cl.[4] G05F *1/67, 1/625*
U.S. Cl. 318—332 **4 Claims**



1. A control device for a variable speed electric motor comprising:

a control circuit for supplying a speed command signal to a variable speed electric motor adapted to be driven by a solar battery;

a short-circuit switch connected in parallel to said solar battery;

a current transformer for detecting a short-circuit current of

said solar battery adapted to flow upon closing of said short-circuit switch;

a current conversion unit for determining a quantity of light received by said solar battery from said short-circuit current as detected by said current transformer, and generating a predetermined current command signal according to said quantity of light to be received;

a voltage detector connected in parallel to said solar battery for detecting an open circuit voltage of said solar battery;

a converter for converting a temperature of said solar battery according to said open circuit voltage as detected by said voltage detector;

a compensator for compensating said current command signal according to said temperature;

a load current detection unit for detecting a load current to said variable speed electric motor and generating a load current signal; and

an operating unit for supplying a speed command signal to said control circuit according to said current command signal as compensated and said load current signal.

4,620,141

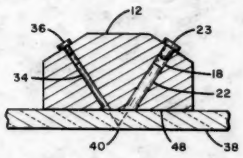
RAIN-CONTROLLED WINDSHIELD WIPERS

Roger D. McCumber, and Rein S. Teder, both of Minnetonka, Minn., assignors to Vericom Corp., Minnetonka, Minn.

Filed Jul. 3, 1985, Ser. No. 751,544

Int. Cl.[4] B60S *1/08*

U.S. Cl. 318—483 **7 Claims**



1. In a motor vehicle of the type incorporating a windshield and a motor-driven windshield wiper, an improved windshield wiper motor controller for automatically activating the motor of said motor-driven windshield wiper upon detection of moisture droplets on the exterior surface of said windshield, comprising:

(a) an opaque housing secured to the inside surface of said windshield, said housing having a first and a second plurality of bores whose longitudinal axes intersect at points at the exterior surface of said windshield and at an acute angle to the plane of the windshield, said first plurality of bores including individual radiant energy sources and said second plurality of bores including individual radiant energy sensors, individual ones of said sources being associated with individual ones of said sensors;

(b) driver means for periodically energizing said radiant energy sources with pulses of a predetermined duty cycle;

(c) balanced detector means coupled to said plurality of radiant energy sensors for detecting changes in the amount of light energy from said individual radiant energy sources impinging on its associated radiant energy sensor, and producing an error signal proportional to the degree of unbalance of said detector means;

(d) synchronous switching means coupled to said driver means for switching said error signal on and off in synchronism with said pulses from said driver means;

(e) comparator means coupled to said synchronous switching means for producing a voltage output when the amplitude of said error signal falls outside of a predetermined range of amplitudes; and

(f) a voltage-controlled oscillator having an input and an output, said input being coupled to receive said voltage output of said comparator means and said output being coupled in controlling relation to said motor.

4,620,142

SEQUENCE SWITCHING SYSTEM IN TRACER CONTROL UNIT

Etuo Yamazaki, and Hitoshi Matsuura, both of Hachioji, Japan, assignors to Fanuc Ltd, Minamitsura, Japan

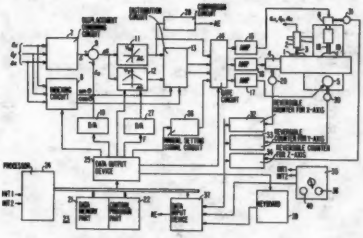
PCT No. PCT/JP84/00396, § 371 Date Apr. 2, 1985, § 102(e) Date Apr. 2, 1984, PCT Pub. No. WO85/00772, PCT Pub. Date Feb. 28, 1985

PCT Filed Aug. 7, 1984, Ser. No. 723,953

Claims priority, application Japan, Aug. 11, 1983, 58-124939

Int. Cl.[4] G05B *19/36*

U.S. Cl. 318—578 **5 Claims**



1. A sequence switching system in a tracer control unit which operates to provide a tracing direction and a tracing speed based on signals from a tracer head tracing the surface of a model and performs tracer control, comprising a control switch for inputting a sequence switching signal, a sequence changeover ignore means for ignoring the current sequence changeover during actuation of the control switch, and a sequence changeover execute means for executing the sequence changeover which as been or is to be ignored when the operation of the control switch is released.

4,620,143

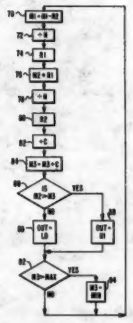
DIGITAL PULSE WIDTH MODULATION MOTOR CONTROL SYSTEM

Thomas C. Matty, N. Huntingdon Township, Irwin County, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 9, 1984, Ser. No. 670,423

Int. Cl.[4] H02P *5/40*; H02M *5/458*

U.S. Cl. 318—811 **9 Claims**



1. In apparatus for controlling the energization of a load through an inverter coupled with a power supply, the combination of

first means generating a cosine function by successively providing a first value and generating a sine function by successively providing a second value, with the first value being provided in accordance with the second value and the second value being provided in accordance with the first value,

second means generating a carrier wave by successively providing a third value, with a predetermined time period being provided between each of the successive third values such that one of a sawtooth or a triangular carrier wave is established, and

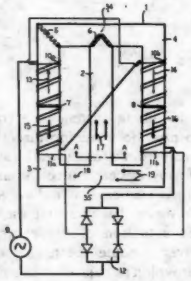
third means comparing one of the first and second values with said third value for providing successive output signals for controlling said inverter to determine the energization of said load.

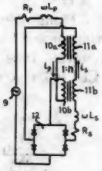
4,620,144

SELF-CONTROLLED VARIABLE INDUCTOR WITH AIR GAPS

Léonard Bolduc, Ste-Julie, Canada, assignor to Hydro-Quebec, Montreal, Canada

Filed May 15, 1985, Ser. No. 734,099
Claims priority, application Canada, Jan. 16, 1985, 472204
Int. Cl.[4] G05F *1/325*
U.S. Cl. 323—331 **30 Claims**





1. Variable inductor comprising:

a magnetic core provided with three limbs each having a first end and a second end, said first ends being interconnected through a first common point of the magnetic core, and said second ends being interconnected through a second common point of said magnetic core;

primary winding means supplied with an alternating current;

control winding means; and

means for supplying the control winding means with a direct current having an amplitude which varies in relation with an electric parameter related to the operation of said variable inductor;

said primary winding means and said control winding means being disposed with respect to the magnetic core so that said alternating and direct currents induce in a first of said three limbs an alternating magnetic flux and a direct current magnetic flux which assist each other or which are in opposition with respect to each other when said alternating current has a positive or negative value, respectively, and in a second of said three limbs an alternating magnetic flux and a direct current magnetic flux which are in opposition with respect to each other or which assist each other when said alternating current has a positive or negative value, respectively, the direct current magnetic flux induced in each of said first and second limbs having a density which varies with the amplitude of said direct current for thereby varying the impedance of the primary winding means;

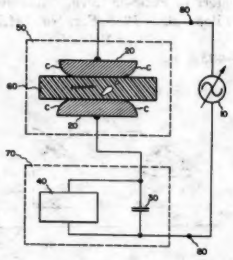
said first limb comprising gap means traversed by the resultant magnetic flux induced in this first limb, and said second limb comprising gap means traversed by the resultant magnetic flux induced in this second limb.

4,620,145

NON-DESTRUCTIVE DETECTION OF VOIDS IN PLASTIC MATERIALS

Peter W. Dietz, Greenwich, and Amandus H. Sharbaugh, Clifton Knolls, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 20, 1984, Ser. No. 642,227
Int. Cl.[4] G01N *27/61, 27/62, 27/42*
U.S. Cl. 324—54 **8 Claims**



1. Apparatus for detecting the presence of a void contained internally of a dielectric material, comprising:

means for producing an electric field through said material, said field producing means comprising a pair of electrodes disposed to receive said material therebetween and adapted to provide a substantially uniform electric field through said material, said electrode pair being coupled to a source of AC voltage;

means for increasing said field to a level sufficient to cause a partial discharge through said void but insufficient to cause an electrical discharge through said dielectric material, said field increasing means being adapted to increase the magnitude of the voltage applied to said electrode pair, said discharge being characterized by a transfer of a small amount of electrical charge through a gaseous inclusion in said dielectric material; and

means for detecting the discharge through said void.

4,620,146

MICROWAVE MOISTURE SENSOR

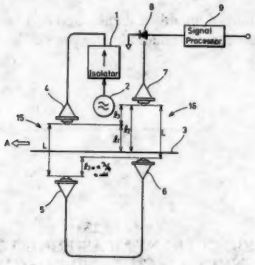
Hirotoshi Ishikawa, and Seiichiro Kiyobe, both of Tokyo, Japan, assignors to Kogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Apr. 20, 1984, Ser. No. 602,594
Claims priority, application Japan, Apr. 26, 1983, 58-73538
Int. Cl.[4] G01B *15/02;* G01R *27/26*
U.S. Cl. 324—58.5 A **4 Claims**

1. A microwave moisture sensor for sensing moisture content in a sheet like measurand having a plane surface by measuring the attenuation of microwave passed through said measurand, comprising at least

a first transmission and reception system for emitting a microwave against said measurand and receiving said microwave having passed through said measurand and being attenuated thereby, said first transmission and reception system comprising first transmission horn antenna and first reception horn antenna spaced in confronting relation with respect to each other by a constant distance, with said measurand disposed therebetween;

a second transmission and reception system comprising a second transmission horn antenna disposed on the same side of said measurand in which said first reception horn antenna is disposed, for re-emitting said attenuated microwave as received by said first reception horn antenna against said measurand, and a second reception horn antanna spaced in confronting relation from said said second transmission horn antenna by said constant distance, for receiving said microwave emitted from said second transmission antenna and having passed through said measureand and being attenuated thereby, wherein the offset between antennas at the same side of the measurand, measured in a direction perpendicular to the measurand plane, is equal to an odd multiple of quarter lambda, wherein lambda is the wavelength of said microwave; and



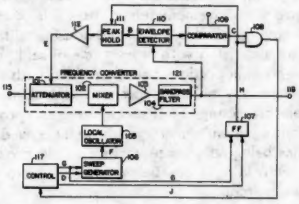
signal processor means for processing signals from said second reception horn with a preset signal indicative of the moisture basis weight of said measurand and predetermined moisture calibration data, thereby to generate a moisture percentage signal which is substantially unaffected by vibration of the measurand.

4,620,147

SIGNAL DETECTOR

Shoji Niki, Saitama, Japan, assignor to Takeda Riken Co., Ltd., Tokyo, Japan

Filed Feb. 16, 1984, Ser. No. 580,888
Claims priority, application Japan, Feb. 21, 1983, 58-28298
Int. Cl.[4] G01R *23/16*
U.S. Cl. 324—77 A **19 Claims**



1. A signal detector for detecting the frequency component having the largest amplitude in a plurality of frequency components contained in an input signal, comprising

a sweep generator for generating a sweep signal,

a local oscillator for generating a local signal whose frequency is swept by the sweep signal from the sweep generator,

a frequency converter for converting said input signal to an intermediate frequency signal by mixing said input signal with said local signal,

an envelope detector for detecting the envelope of the intermediate frequency signal from the frequency converter and for providing a corresponding output,

a peak-hold circuit for storing the peak voltage of said output of the envelope detector and for providing a corresponding output,

negative feedback means for controlling the gain of the frequency converter according to said output from the peakhold circuit,

a comparator for comparing said output of the envelope detector with a reference voltage level and for outputting a corresponding comparison signal when said output of the envelope detector exceeds said reference level, after said desired gain is determined,

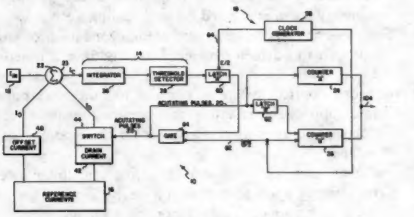
wherein a desired gain of said frequency converter is determined by the amplitude of said frequency component having the largest amplitude, and said desired gain of said frequency converter is maintained during at least part of a subsequent sweep of said sweep signal, until said output of said frequency converter corresponds to said frequency having the largest amplitude.

4,620,148

CURRENT METER

Arthur L. Davison, Canyon Country; Martin D. Blackburn, Costa Mesa, and Donald A. Sellek, Manhattan Beach, all of Calif., assignors to Baird Corporation, Bedford, Mass.

Filed Aug. 27, 1984, Ser. No. 644,242
Int. Cl.[4] G01R *17/06, 19/26;* H03K *13/02*
U.S. Cl. 324—99 D **10 Claims**



1. A current meter possessing a dynamic range of about eight orders of magnitude and having an input and an output, said current meter comprising:

(a) a source of input current coupled to said input;

(b) means also coupled to said input for detecting said input current from said source;

(c) a source of reference currents coupled to said input and said detecting means;

(d) means for generating a series of pulses to actuate said reference currents source;

(e) a counter coupled to said generating means to count said series of pulses applied to actuate said reference currents source during a predetermined time interval;

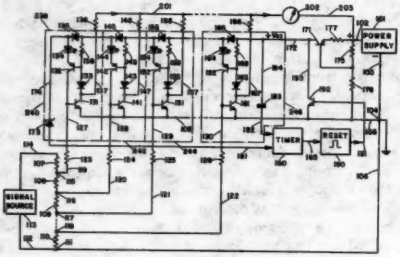
(f) said means for generating said series of pulses including a clock generator to generate clock pulses, a latch and a gate coupled between said detecting means and said counter and enabled by said detecting means; and

(g) a first optical coupler connected between said latch and said detecting means and a second optical coupler connected between said gate and said source of reference currents.

4,620,149
METHOD AND SYSTEM FOR RECORDING AND DISPLAYING INPUT DATA SIGNALS

Edward Cooper, San Diego, Calif., assignor to Power-Science, Inc., San Diego, Calif.

Filed Sep. 27, 1982, Ser. No. 423,603
Int. Cl.[4] G01R *11/63*
U.S. Cl. 324—103 P **5 Claims**



1. A system for recording and displaying input data signals comprising:

scaling network means having parallel entry output lines responsive to input data signals for providing output signals in lines corresponding to the magnitude of the input data signals,

memory means having a plurality of stages energized by said output signals corresponding to signals in said lines of said scaling network means,

said memory means having means for providing a magnitude output corresponding to each of said stages energized by said scaling network,

meter means responsive to the output of said memory output for reading the particular magnitude of the output of the memory stage energized by said scaling network,

timer means responsive to said memory means providing an output to said meter means for providing a timed reset timing pulse,

memory control means responsive to said reset pulse for interrupting and resetting said memory means to receive corresponding output signals from the scaling network means,

and timer control means for restarting said timer means in mid-timing upon said memory means receiving a higher level corresponding signal from said scaling means.

4,620,150
ELECTRIC METER WITH ELECTRONIC ROLLING DEMAND REGISTER

Warren R. Germer, Dover, and Richard A. Balch, Rochester, both of N.H., assignors to General Electric Company, Somersworth, N.H.

Filed Apr. 12, 1984, Ser. No. 599,742
Int. Cl.[4] G01R *19/16, 11/64, 1/40*
U.S. Cl. 324—103 R **9 Claims**

1. An electronic demand register for an electric meter comprising:

means for defining a demand subinterval;

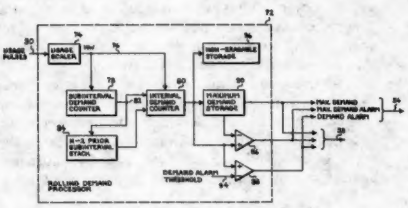
means for defining a demand interval equal to an integral number N of said demand subintervals;

means for summing a power usage data during each demand subinterval with a sum of demand data from N−1 prior demand subintervals to derive a rolling interval demand;

means for storing a maxium demand;

means for comparing said rolling interval demand with said maximum demand; and

means for replacing said maximum demand with said rolling interval demand if said rolling interval demand exceeds said maximum demand whereby said means for storing a

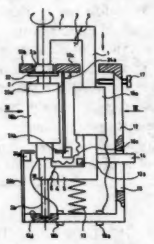


maximum demand remains updated with a maximum rolling interval demand in any preceding demand interval.

4,620,151
ELECTRIC CURRENT MEASURING TONGS WITH MAGNETIC CIRCUIT AND PIVOTING ARM

Bernard Landre, Paris, France, assignor to Universal Technic, Paris, France

Filed Dec. 20, 1983, Ser. No. 563,636
Claims priority, application France, Dec. 22, 1982, 82 21586
Int. Cl.[4] G01R *1/20*; H01F *17/06*
U.S. Cl. 324—127 **9 Claims**



1. Tongs for measuring the electric current flowing in an electric conductor by a magnetic circuit surrounding the conductor and having an electric circuit associated with said magnetic circuit comprising:

a housing; and

means defining a magnetic circuit including two elements mounted for movement relative to each other, said elements having portions within said housing with an electric winding associated with at least one of said portions and said in-housing portions being provided with confronting complementary oblique faces and said elements having portions projecting out of said housing and provided with confronting complementary oblique faces, said projecting portions being adapted to enclose an electric conductor, said confronting faces being engageable to close said magnetic circuit,

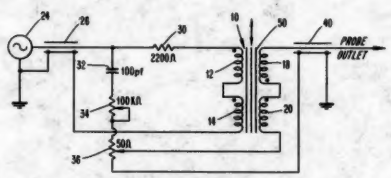
one of said elements being mounted for translational movement and the other of said elements being mounted for rotational movement to disengage said faces and move said faces of said projecting portions apart for reception therebetween of an electric conductor.

4,620,152

LIFT-OFF COMPENSATION OF EDDY CURRENT PROBES BY TRANSLATING WITHOUT ROTATION THE X-Y COORDINATE PLOT OF THE COMPLEX LOCUS OF THE PROBE OUTPUT

James A. Bains, Jr., Pearland, Tex., assignor to AMF Tuboscope, Inc., Houston, Tex.

Filed Jan. 11, 1983, Ser. No. 457,321
Int. Cl.[4] G01N 27/72; G01R 33/12
U.S. Cl. 324—225 7 Claims



4. Means for compensating the output of an eddy current probe to be used for nondestructively inspecting a steel object to minimize the influence on the phase of the probe output signal of probe lift-off from the surface of the object, comprising the combination

an eddy current probe having a two section coil bobbin with respective primary windings wound in each section and respective secondary windings wound coaxially over a primary winding in each section, said primary windings being wound in series aiding relationship and the secondary windings being wound in series opposed relationship,

an adjustable magnetic core disposed in said coil bobbin,

a source of exciting signals coupled to said primary windings,

probe output means coupled to one end of the series connected secondary windings,

an electrical compensating circuit coupled at one end between said source and said primary windings and having other connections to said series connected secondary windings and to said probe output means,

means for varying the electrical parameters of the compensating circuit and/or the adjustment of the magnetic core to provide a compensating signal of selectable magnitude and phase,

said compensating circuit and magnetic core being adjusted to cause the origin of the complex locus of the probe output signal corresponding to intended operating conditions to translate, substantially without rotation of the complex locus, from its position at the origin of the X-Y coordinate plot made in the absence of said steel object to a new position where phasors from the original origin to different points on the complex locus for a given steel are at substantially the same phase angle.

4,620,153

MAGNETIC RESONANCE IMAGING SYSTEM

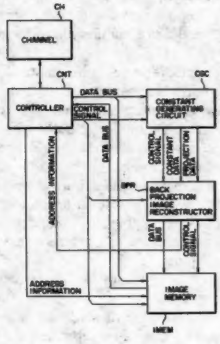
Masaaki Hino, Ootawara, Japan, assignor to Kabushiki Kaisha Toshiba, Tokyo, Japan

Filed Oct. 16, 1984, Ser. No. 661,459
Claims priority, application Japan, Oct. 17, 1983, 58-193750
Int. Cl.[4] G01R 33/20
U.S. Cl. 324—309 7 Claims

1. A magnetic resonance imaging system in which a magnetic resonance phenomenon is caused in an object to be examined, a magnetic resonance signal which is induced by the magnetic resonance phenomenon is detected, projection data, in which resonance data of specific nucleus is projected on a specific slice of the object to be examined, can be obtained in many directions in accordance with a detection signal, an image reconstruction processing using the projection data is performed, and image data which represents at least one of a spin density of the specific nucleus and a relaxation time constant is obtained, comprising an image reconstruction processing means for performing the image reconstruction processing, said image reconstruction processing means comprising:

a central processing unit for respectively generating data of a reconstruction starting point of projection data about a first line parallel to a second direction in a reconstruction image matrix in which coordinate axes consist of a first direction corresponding to a direction parallel to a projection angle reference direction and the second direction perpendicular to the first direction, and data of a sampling interval and data of a predetermined correction coefficient value of the projection data along the first and second directions for every projection;

a constant generating circuit for sequentially generating respective data of the sampling interval for the second direction and the correction coefficient value for every projection and for generating the reconstruction starting point data of respective lines which are aligned along the first direction and parallel to the second direction in correspondence to the reconstruction starting point of the first line parallel to the second direction, and the sampling



intervals for the first and second directions and the correction coefficient value which are provided from said central processing unit;

a reconstructor in which reconstruction sampling positions of the projection data along a line direction parallel to the second direction corresponding to the reconstruction starting points are obtained by adding the sampling intervals to the respective reconstruction starting points in correspondence with the data of the sampling interval for the second direction and the correction coefficient values and reconstruction starting points of the respective lines parallel to the second direction in the reconstruction image matrix which are supplied from said constant generating circuit, thereby performing back projection on the reconstruction image matrix for the sampling positions;

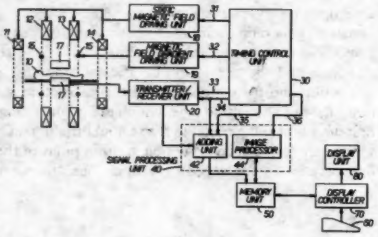
an image memory for accumulating and holding image data which is back-projected by said reconstructor; and

a timing controlling unit for generating control signals for determining an operation timing and supplying the same to said constant generating circuit, said reconstructor and said image memory.

4,620,154
IMAGING METHOD AND APPARATUS FOR OBTAINING SPIN-LATTICE RELAXATION TIME IMAGE UTILIZING NUCLEAR MAGNETIC RESONANCE

Tamon Inouye, Kawasaki, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jun. 19, 1984, Ser. No. 622,267
Claims priority, application Japan, Jul. 20, 1983, 58-130958
Int. Cl.[4] G01R *33/22*
U.S. Cl. 324—309 **10 Claims**



3. An apparatus for generating an image of a designated slice of an object using a saturation recovery method and an inversion recovery method of nuclear magnetic resonance, comprising:

a. means for generating a uniform static magnetic field and applying said static magnetic field to said object;

b. means for generating a magnetic field gradient with said uniform static magnetic field thereby defining a slice of said object orthogonal to said field gradient for a particular resonance frequency;

c. means for generating first and second pulse sequences in accordance with said saturation-recovery method and said inversion-recovery method respectively, wherein each pulse sequence includes a selective excitation pulse (SEP) and a 180° pulse;

d. means for generating an alternating magnetic field wherein said alternating magnetic field passes through said designated slice of said object and said alternating magnetic field is applied with said first and second pulse sequences generated by said first and second pulse sequence generating means;

e. means for detecting spin-echo signals from said object after a predetermined spin-echo interval from said 180° pulse of said first and second pulse sequences;

f. means for reconstructing first and second images of said designated slice from said spin-echo signals corresponding to said saturation-recovery method and inversion-recovery method respectively; and

g. means for generating a third image from said first and second images, whereby said first, second and third image each include pixel data, and said third image pixel data represents a distribution of relaxation time T_1 on said designated slice, being a ratio of pixel data of said first image and corresponding pixel data of said second image.

4,620,155
NUCLEAR MAGNETIC RESONANCE IMAGING ANTENNA SUBSYSTEM HAVING A PLURALITY OF NON-ORTHOGONAL SURFACE COILS

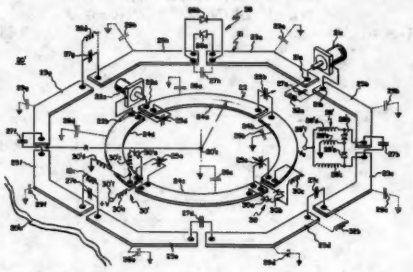
William A. Edelstein, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 16, 1984, Ser. No. 641,234
Int. Cl.[4] G01R *33/20*
U.S. Cl. 324—322 **21 Claims**

1. An antenna subsystem for use in magnetic resonance imaging of selected nuclei in a sample, comprising:

a plurality of substantially planar surface coil antennae disposed with the planes thereof in a non-orthogonal registered relationship;

first means, forming a portion of each of said surface coil antennae to be uitlized for sample excitation with an externally-provided radio-frequency (RF) excitation signal, for causing the associated surface coil antenna to be resonant,



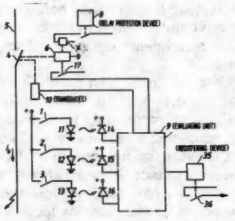
at the Larmor frequency of the selected nuclei, responsive only to an externally-provided switching signal; and

second means, forming a portion of each of said surface coil antennae to be utilized for response signal reception, for detuning the associated surface coil antenna at least when a radio-frequency signal is induced therein by the RF excitation signal in one of said excitation antennae.

4,620,156
CONDITION INDICATOR

Kjell Alvin, and Kurt Hakansson, both of Ludvika, Sweden, assignors to Asea Aktiebolag, Västerås, Sweden

Filed Oct. 22, 1984, Ser. No. 663,369
Claims priority, application Sweden, Oct. 24, 1983, 8305842
Int. Cl.[4] G01R *31/02*
U.S. Cl. 324—424 **4 Claims**



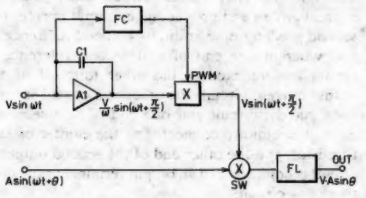
1. Means for monitoring the condition of an electric device with current-breaking contacts defining movable parts, in particular a high voltage circuit-breaker, said means comprising members (1, 2, 3) for sensing the current through the circuit-breaker, a calculating member (9) which is controlled from an activating member (10) influenced by the movable parts of the device and which is connected to said current-sensing members and arranged to calculate a value—corresponding to the sensed current—of the contact wear during a breaking operation, and a presentation member (35) which is controlled from the calculating member (9) and arranged to record the degree of the total contact wear, said current-sensing members (1, 2, 3) comprising a plurality of reed contacts having different sensitivity and/or being arranged in different positions relative to the current path (5) through the device, so that the reed contacts (1, 2, 3) are activated at different current levels, said calculating member (9) including means for weighting the pulses generated by the different reed contacts (1, 2, 3).

4,620,157

REACTIVE POWER TO DC SIGNAL CONVERTER

Eiji Hayashi, Tokyo, Japan, assignor to Yokogawa Hokushin Electric Corporation, Tokyo, Japan

Filed Jun. 6, 1985, Ser. No. 741,814
Claims priority, application Japan, Jun. 22, 1984, 59-128496
Int. Cl.[4] G06G 7/16
U.S. Cl. 328—160 8 Claims



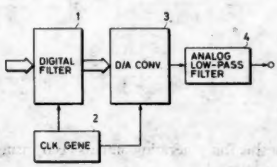
1. A reactive power to DC signal converter comprising
a capacitor for shifting the phase of either a voltage input or a current input to an AC circuit;
a frequency detector circuit for producing a signal proportional to a frequency in the AC circuit;
a first multiplier circuit for multiplying the output from said capacitor by the output from said frequency detector circuit;
a second multiplier circuit for multiplying the voltage input or the current input to the AC circuit by the output from said first multiplier circuits; and
a smoothing circuit for smoothing the output from said second multiplier.

4,620,158

PCM SIGNAL DEMODULATING CIRCUIT

Kenichiro Yasukawa, Saitama, Japan, assignor to Pioneer Electronic Corp., Tokyo, Japan

Filed Aug. 22, 1985, Ser. No. 768,381
Claims priority, application Japan, Aug. 22, 1984, 59-127233[U]
Int. Cl.[4] H03K 9/00; H04B 14/04
U.S. Cl. 329—50 3 Claims



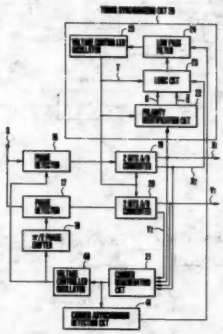
1. In a PCM signal demodulating circuit comprising means for processing a PCM signal including a digital signal corresponding to a code representative of a first sample value obtained by sampling an analog signal at a first sampling frequency to obtain said analog signal through demodulation, the improvement wherein said PCM signal demodulating circuit further comprising: means for processing said first sample value to calculate a pseudo sample value equivalent to a second sample value obtained by sampling said analog signal at a second sampling frequency higher than said first sampling frequency.

4,620,159

DEMODULATOR FOR MULTIPHASE PSK OR MULTILEVEL QAM SIGNALS

Yasuharu Yoshida, and Manabu Yagi, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Aug. 27, 1985, Ser. No. 769,922
Claims priority, application Japan, Aug. 27, 1984, 59-177857
Int. Cl.[4] H03D 3/18
U.S. Cl. 329—50 3 Claims

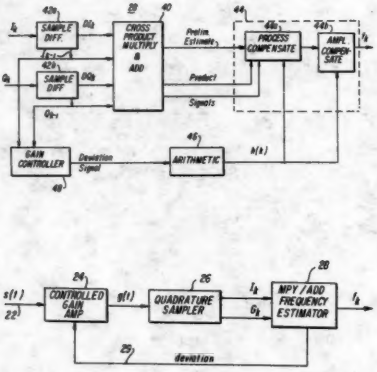


1. A demodulation device comprising:
phase detector means for demodulating a multiphase PSK carrier wave or a multilevel QAM wave into a baseband signal;
A/D converter means for sampling the output signal of said phase detector means in response to a timing signal and converting it to digital signals;
means responsive to said digital signals from said A/D converter means for supplying a carrier wave to said phase detector means;
timing synchronizing means for generating a timing signal representing a timing of sampling of said A/D converter means, and timing synchronizing means having a timing signal generator, a phase of which is controlled by a predetermined phase control signal, which generates the timing signal, and which includes a low-pass filter and a voltage controlled oscillator adapted to receive the output from said filter and to provide an output in at least a loop with a loop parameter, a polarity identification circuit for receiving a first predetermined signal among said digital signals from said A/D converter means, identifying a polarity of a differential coefficient of the baseband signal at a sampling point of said A/D converter means and generating a polarity identification signal, and logic circuit means for receiving and processing according to a predetermined logic the polarity identification signal from said polarity identification circuit and a second predetermined signal among said digital signals from said A/D converter means and generating and supplying to said timing signal generator a phase control signal representing a deviation of an actual sampling point of the baseband signal from an optimal sampling point; and
carrier asynchronism detecting means for detecting an asynchronism state of said carrier wave supplying means and supplying to said timing synchronizing means a signal which controls said loop parameter of said timing synchronizing means.

4,620,160
DIGITAL DEMODULATOR FOR CONTINUOUSLY PHASE OR FREQUENCY MODULATED SIGNALS

William N. Waggener, Sarasota, Fla., assignor to Fairchild Weston Systems, Inc., Sarasota, Fla.

Filed Dec. 17, 1984, Ser. No. 682,218
Int. Cl.[4] H03D *5/00*
U.S. Cl. 329—104 19 Claims



1. Digital demodulating apparatus comprising:

sampling means for sampling a received phase or frequency modulated signal and for providing samples thereof;

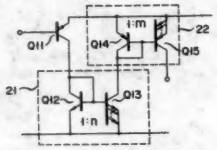
digital circuit estimating means receiving said samples of the received signal for providing a signal representing a first estimate of a modulating phase angle of the received modulated signal; and

means for maintaining a substantially constant input amplitude to said sampling means thereby to permit said digital circuit estimating means to provide said signal representing said first estimate of the modulating phase angle of the received signal by determination of sample differentials and by adding and subtracting products of said samples and said differentials.

4,620,161
COMPOSITE TRANSISTOR CIRCUIT

Tatsuo Tanaka, and Nana Shigematsu, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba and Toshiba Audio Video Engineering Co., Inc., both of, Japan

Filed May 8, 1985, Ser. No. 731,980
Claims priority, application Japan, May 23, 1984, 59-104035
Int. Cl.[4] H03F *3/45*
U.S. Cl. 330—257 5 Claims



1. A composite transistor circuit which comprises:

an input transistor of a first polarity whose emitter is connected to a first power source;

a first current mirror circuit formed of transistors of a second polarity; the first current mirror circuit comprising a first reference current circuit and a first output current circuit and producing an output current bearing a first predetermined ratio to first reference current; and wherein one end of said first reference current circuit is connected to the collector of said input transistor; and the other end of said first reference current circuit and one end of said first output current circuit are connected to a second power source; and

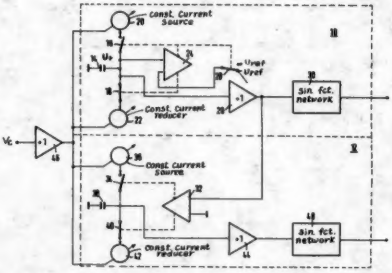
a second current mirror circuit formed of transistors of the first polarity; the second current mirror circuit comprising a second reference current circuit and a second output current circuit and producing an output current bearing a second predetermined ratio to a second reference current; and wherein one end of said second reference current circuit is connected to the other terminal of said first output current circuit; the other end of said second reference current circuit and one end of said second output current circuit are connected to the emitter of said input transistor; and the other end of the second output current circuit is connected to an output terminal of the composite transistor circuit;

whereby said input transistor, first current mirror circuit and a second current mirror circuit equivalently constitute a composite transistor whose base, emitter and collector are respectively constituted, as equivalently viewed, by the base and emitter of the first transistor and the other end of the second output current circuit.

4,620,162
TUNABLE TRIANGLE WAVE GENERATOR WITH TWO-PHASE SINUSOIDAL OUTPUTS

Jörg Quittkat, Neuberg; Gerhard Thiel, Freigericht, and Ruth Ursula, Ronneburg, all of Fed. Rep. of Germany, assignors to Nukem GmbH, Hanau, Fed. Rep. of Germany

Filed Sep. 17, 1984, Ser. No. 651,319
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1983, 3334592
Int. Cl.[4] H03K *3/023*
U.S. Cl. 331—45 13 Claims



8. Apparatus for generating signals comprising:

a first capacitor;

first comparing and switching means for charging said first capacitor when the voltage across said first capacitor falls to a preset lower level and for discharging said first capacitor when the voltage across said first capacitor rises to a preset upper level greater than said lower level;

a second capacitor having a capacitance equal to the capacitance of said first capacitor; and

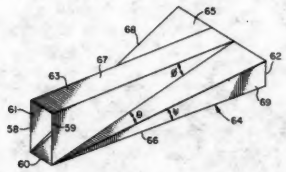
second comparing and switching means for comparing the voltage across said first capacitor with a preset reference level and for alternately charging and discharging said second capacitor in response to the result of said comparison.

4,620,163

TE_{10} RECTANGULAR TO TE_{01} CIRCULAR WAVEGUIDE MODE LAUNCHER

Lock R. Young, Palm Bay, Fla., assignor to Harris Corporation, Melbourne, Fla.

Filed Apr. 17, 1984, Ser. No. 601,292
Int. Cl.[4] H01P 1/16
U.S. Cl. 333—21 R 11 Claims



1. For use in an electromagnetic wave launcher, a device for converting a TE_{10} rectangular made wave to a TE_{20} rectangular mode wave comprising:

a first open-ended wedge-shaped waveguide section having an open input end of rectangular cross-section to which a TE_{10} rectangular mode wave is to be applied, and tapering to a vertex at an open output end of said device; and

a second open-ended wedge-shaped waveguide section having an open output end of rectangular cross-section from which a TE_{20} rectangular mode wave is to be output, and tapering to a vertex at an open input end of said device; and wherein

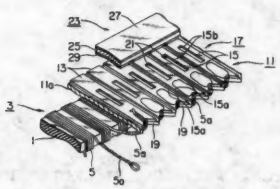
said first section is integrally coupled with said second section so that the vertex of said first section at the open output end of said device forms part of an edge of the rectangular cross-section output end of said second section and the vertex of said second section at the open input end of said device forms part of an edge of the rectangular cross-section input end of said first section.

4,620,164

VARIABLE DELAY LINE HAVING LINKING ELECTRODE WITH DEPRESSIONS THEREIN FOR SNUG ENGAGEMENT OF MOVEABLE CONTACT

Kazuo Kameya, Tsurugashima, Japan, assignor to Elmec Corporation, Saitama, Japan

Filed Oct. 30, 1984, Ser. No. 666,301
Claims priority, application Japan, Nov. 2, 1983, 58-170175[U]; Nov. 2, 1983, 58-170176[U]; Nov. 18, 1983, 58-178515[U]
Int. Cl.[4] H03H 7/34
U.S. Cl. 333—139 3 Claims



1. A lumped constant type variable delay line capable of varying the delay time of a superhigh-speed rise signal, comprising:

an inductance element formed by a winding of a conductor and having a plurality of taps thereon;

a plurality of capacitors, each capacitor having a ground electrode on one side connected in a common ground connection and a capacity electrode on the other side,

a plurality of of linking electrodes disposed along said inductance element and adapted to interconnect said taps to said capacity electrodes of said plurality of capacitors, said linking electrodes having fixed contacts; and

movable contact means adapted to advance while keeping in pressed contact with said fixed contacts, thereby permitting selection of particular ones of said taps of said inductance element;

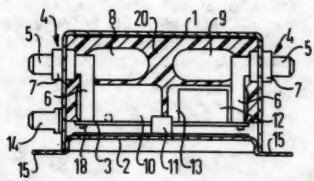
said linking electrodes each incorporating therein a depression for receiving into snug engagement said movable contact means at the time that said movable contact means is set in place on the particular fixed contact element selected.

4,620,165

ELECTRICAL SUPPRESSOR FILTER

Hans Kinzler, Regensburg, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Dec. 21, 1983, Ser. No. 563,905
Claims priority, application Fed. Rep. of Germany, Dec. 22, 1982, 3247546; Mar. 29, 1983, 3311443
Int. Cl.[4] H03H 7/01; H02B 1/10
U.S. Cl. 333—167 14 Claims



1. An electrical suppressor filter comprising: a filter housing including a housing cover, a circuit board located within the housing, and electrical components electrically connected to the circuit board, power connection plugs mounted in the housing wall, said power connection plugs having integral legs that are flat and L-shape and extend through said housing wall into the interior of said housing; said circuit board being adapted to fit over the end portion of said legs; and said circuit board having electrical conductors which are electrically connected to said legs and said circuit board is supported by said legs before the housing cover is mounted on the filter housing.

4,620,166

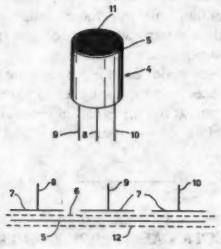
MULTIPLE WOUND CAPACITOR NOISE FILTER WITH COMMON LAYER

Americo De Faveri, Longarone; Sergio Zanvettor, Ospitale di Cadore, and Antonio Savi, Dogna di Longarone, all of Italy, assignors to Zanussi Elettromeccanica S.p.A., Pordenone, Italy

Filed Oct. 19, 1982, Ser. No. 435,398
Claims priority, application Italy, Nov. 27, 1981, 34052/81[U]
Int. Cl.[4] H03H 7/00; H01G 4/38
U.S. Cl. 333—184 2 Claims

1. A single-winding capacitive filter having first and second opposite ends and comprising: a wound continuous metal layer and a discontinuous metal layer separated by a dielectric, said layers forming a plurality of capacitors having at least one common wound layer and non-common wound layers, said non-common wound layers of said plurality of capacitors each comprise respective portions of said discontinuous metal layer and have respective terminals protruding axially from said first end of said filter, wherein said continuous metal layer pro-

trudes from said second end of said filter at least for a certain number of turns whose protruding portions are electrically



interconnected by means of a short-circuit means; whereby self inductance of said filter is reduced.

4,620,167

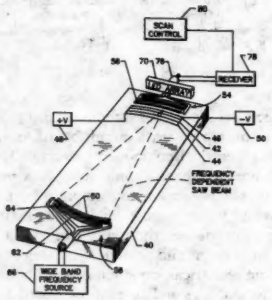
SURFACE ACOUSTIC WAVE SYSTEMS AND METHODS

Robert E. Brooks, Manhattan Beach, and David Penunuri, Placentia, both of Calif., assignors to TRW Inc., Ohio

Filed May 9, 1985, Ser. No. 732,117

Int. Cl.[4] H03H *9/12, 9/145;* H04N *5/30*

U.S. Cl. 333—195 **11 Claims**



1. The method of controlling a surface acoustic wave field comprising the steps of:

propagating a surface acoustic wave along a wave propagating surface, the wave propagating surface including an interaction region disposed along the propagation direction of the surface acoustic wave, in which interaction region wave responsive electric fields exist along with electrical carriers;

increasing the density of the carriers in a selected spatial pattern in the interaction region by illumination with electromagnetic wave energy to produce an interaction between the electric field and the carriers such that wave energy from the acoustic wave is substantially dissipated in selected regions;

varying the selected spatial pattern dynamically during propagation of the surface acoustic wave, wherein the surface acoustic wave varies in direction along the surface and the spatial pattern is varied in accordance with the direction of the surface acoustic wave; and

placing a voltage across the interaction region to more quickly draw off carriers from the interaction region upon termination of illumination at a selected portion of the interaction region.

4,620,168

COAXIAL TYPE TUNABLE HYPERFREQUENCY ELIMINATION BAND FILTER COMPRISING OF DIELECTRIC RESONATORS

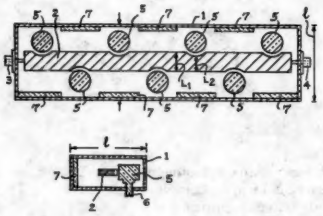
Xavier Delestre, Paris, and Marc Sauvage, La Garenne-Colombes, both of France, assignors to Thomson CSF, Paris, France

Filed May 9, 1984, Ser. No. 608,573

Claims priority, application France, May 20, 1983, 83 08423

Int. Cl.[4] H01P *1/20*

U.S. Cl. 333—202 **14 Claims**



1. A tunable hyperfrequency elimination band filter comprising:

rectangular box means for forming an external conductor of a coaxial line, said box means having a top, a bottom, two side walls, and a first longitudinal axis;

internal conductor means for forming an internal conductor of said coaxial line, said internal conductor means having a second longitudinal axis which is substantially parallel with said first longitudinal axis, and a width transverse to said second longitudinal axis and parallel to said bottom, said width being reduced at a plurality of predetermined areas along said second longitudinal axis; and

a plurality of cylindrical dielectric resonators disposed so as to form a line of resonators on said bottom adjacent to the reduced width areas of said internal conductor means, each said resonator having a longitudinal axis which is perpendicular to said second longitudinal axis and parallel to said side walls, each said resonator including support means having a dielectric screw connected to said bottom for adjusting a distance between said resonator and said top when said screw is rotated to cause a central frequency of said filter to be tuned.

4,620,169

MAGNETICALLY TUNABLE DIELECTRIC RESONATOR HAVING A MAGNETICALLY SATURABLE SHIELD

Martin J. Blickstein, Austell, Ga., assignor to Murata Erie N.A., Inc., Smyrna, Ga.

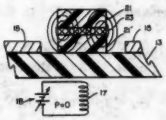
Filed Apr. 4, 1985, Ser. No. 719,982

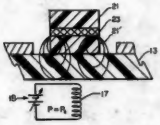
Int. Cl.[4] H01P *7/10*

U.S. Cl. 333—235 **4 Claims**

1. A magnetically tunable dielectric resonator comprising a support, a magnetically saturable shield mounted adjacent one side of said support, a ceramic microwave resonator mounted to a side of said shield facing away from said support, means

for inducing magnetic flux of variable flux densities into said shield for resonant frequency tuning, and a second ceramic





microwave resonator mounted between said support and said shield.

4,620,170

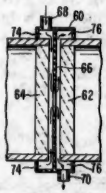
MEANS FOR LIQUID COOLING A MICROWAVE WINDOW

Gordon R. Lavering, Belmont, Calif., assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Dec. 19, 1984, Ser. No. 683,756

Int. Cl.⁴ H01P *1/08*

U.S. Cl. 333—252 **14 Claims**



1. A microwave window assembly, comprising:

first and second dielectric window plates sealed generally parallel to each other across the open section of a waveguide means with a space therebetween;

a dielectric septum having a central aperture, said dielectric septum being mounted in the space between said dielectric window plates and parallel thereto;

means for circulating cooling fluid inwardly between said first dielectric window plate and said dielectric septum, then through said central aperture, and then outwardly between said second dielectric window plate and said dielectric septum.

4,620,171

MOLDED CASE CIRCUIT BREAKER WITH RESETTABLE COMBINED UNDERVOLTAGE AND MANUAL TRIP MECHANISM

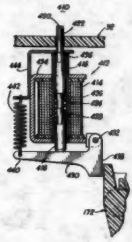
Dante Bagalini, Coraopolis, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 569,058, Jan. 9, 1984, Pat. No. 4,553,116.

This application Apr. 18, 1985, Ser. No. 724,727

Int. Cl.⁴ H01H *73/00*

U.S. Cl. 335—20 **5 Claims**



1. An electrical circuit breaker comprising:

a first electrical contact;

a second electrical contact;

operating means for moving said first and second electrical contacts into engagement and out of engagement;

undervoltage trip means for actuating said operating means to perform a trip operation to disengage said first and second contacts upon the occurrence of an undervoltage condition; and

a case for housing said first and second contacts and said operating means and said undervoltage trip means;

said trip means maintaining said operating means in a tripped condition until said trip means is reset and comprising;

a solenoid having an electrical coil;

a pair of first and second separable ferromagnetic plungers serially disposed within said coil;

a compression spring disposed between said first and second plungers for separating said plungers, the compressive force of said compression spring being less than the electromagnetic force provided by said coil when energized by a voltage greater than a predetermined value; and

reset means engageable externally of said circuit breaker for resetting said trip means, set reset means comprising a reset button in engagement with said first plunger and adapted to extend exteriorly of said case through an aperture formed therethrough.

4,620,172

ELECTROMAGNETIC RELAY WITH SWITCH SPRING

Reiner Rudolf, Fridingen, Fed. Rep. of Germany, assignor to Hengstler GmbH Geschaftsbereich Haller-Relais, Wehingen, Fed. Rep. of Germany

Filed Jun. 25, 1984, Ser. No. 624,255

Claims priority, application Fed. Rep. of Germany, Jun. 28, 1983, 3323266

Int. Cl.⁴ H01H *51/22, 51/08*

U.S. Cl. 335—78 **5 Claims**

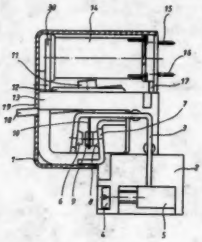
1. For incorporation in an electromagnetic relay having a pair of spaced apart stationary contacts, and having spaced side frame elements for mounting therebetween and therein a tumbler switch,

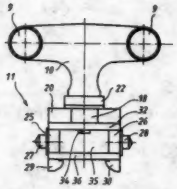
a tumbler switch comprising,

a base component including a magnet and a pair of anchor plates on opposite sides of and confining the magnet, said base component constituting a substantial mass and the greater part of the mass of the tumbler switch,

the base component including a pair of oppositely arranged and co-axial trunnions for mounting the tumbler switch in

said spaced side frame elements, said trunnions being positioned symmetrically of the directions of the base component transverse to the axis of the trunnions, and





a switch spring mounted on the base component and extending therefrom, in direction radially of said axis.

4,620,173

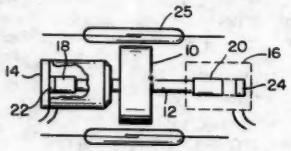
LATCHING MAGNETIC ACTUATOR

Robert B. O'Brien, Pittsford, N.Y., assignor to Robert K. O'Brien, Rochester, N.Y.

Filed May 28, 1985, Ser. No. 738,299

Int. Cl.[4] H01H *9/00*

U.S. Cl. 335—205 **14 Claims**



1. A magnetic actuator comprising an armature, at least a portion of said armature being ferromagnetic, means mounting said armature for reciprocating, rectilinear travel between two predetermined limit positions relative to a selected frame of reference, a pair of auxiliary ferromagnetic bodies, means mounting each of said auxiliary bodies in a fixed position adjacent to a respective one of said limit positions, and electrical coil means operative upon said ferromagnetic portion of the armature to drive the armature alternately in reciprocation between said limit positions, one of said portion of said armature and said auxiliary bodies being of a hard magnetic material and permanently magnetized, said auxiliary bodies and said ferromagnetic portion of said armature being mutually attracted by magnetic forces whereby said armature is magnetically latched at the limit position to which it is last driven by the coil means.

4,620,174

DEFLECTION UNIT FOR A COLOR TELEVISION DISPLAY TUBE

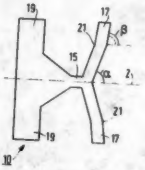
Wilhelmus A. J. Beelaard, and Johannes A. P. de Volder, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 29, 1985, Ser. No. 718,052

Claims priority, application Netherlands, Apr. 6, 1984, 8401102

Int. Cl.[4] H01F *1/00*

U.S. Cl. 335—212 **4 Claims**



1. A deflection unit for a colour television display tube, which deflection unit comprises a field deflection coil, a line deflection coil and an annular member of a magnetically permeable material surrounding at least the line deflection coil, the field deflection coil being wound so that, when the deflection unit is mounted on a display tube having a neck portion, a display screen and an intermediately located cup-shaped outer surface, it produces, upon energization, a pronounced pincushion-shaped field deflection field on the neck side of the deflection unit and a substantially homogeneous field deflection field on the screen side of the deflection unit, and being combined with magnetic field-conducting means to generate a pronounced barrel-shaped field distribution in the centre of the field deflection field, said magnetic field-conducting means comprising two soft-magnetic elements provided diametrically opposite to each other between the field and line deflection coils, substantially parallel to the magnetic field of the field deflection coil, near the centre of the field deflection field, characterized in that each of the two soft-magnetic elements consists of a slightly curved sheet having a central portion, two limbs extending from said central portion, both on its neckside and on its screen side, substantially transversely to the axis of the annular member.

4,620,175

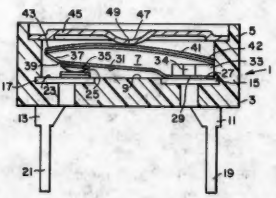
SIMPLE THERMOSTAT FOR DIP MOUNTING

Dennis K. Karr, Sykesville, and David A. Sprankle, Hagerstown, both of Md., assignors to North American Philips Corporation, New York, N.Y.

Filed Oct. 11, 1985, Ser. No. 786,776

Int. Cl.[4] H01H *37/74*

U.S. Cl. 337—343 **9 Claims**



1. A thermostatic switch comprising:

a housing having a cavity defined by walls,

a first contact and a movable second contact, each disposed in said cavity,

first means, for making respective external electrical connections to said first and second contacts, and

second means, for biasing said second contact against, and alternatively moving said second contact in a movement direction away from, said first contact as a function of ambient temperature; said second means comprising an elongated bistable bimetallic element having two ends and defining an elongation direction and a width direction transverse to the elongation direction and said movement direction, and a contact arm, said second contact being disposed on said contact arm adjacent a free end thereof,

characterized in that said cavity is an elongated cavity having first and second ends and a bottom,

said housing includes an abutment surface at said second end of said elongated cavity,

said switch further comprises a cover fixed to said housing over said cavity, said cover having a fulcrum point thereon, and

said bimetallic element is arranged loose in said cavity, with a small clearance in the elongation direction and the width direction, arranged such that in a first stable condition one end of said element bears against said abutment, the other end bears against said contact arm free end so as to hold the contact arm in a stressed condition adjacent the bottom of the cavity, and intermediate said ends the element bears against said fulcrum; and in a second stable condition said one end is substantially free of said abutment, and said other end and said contact arm free end are moved toward said cover and away from said first contact.

4,620,176

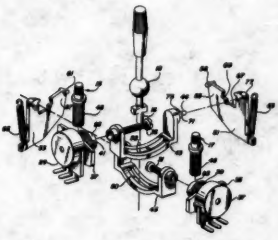
CONTROL STICK MECHANISM

Charles L. Hayes, 770 Cromwell Way, Vista, Calif. 92083

Filed Sep. 25, 1984, Ser. No. 654,379

Int. Cl.[4] H01C *10/16*

U.S. Cl. 338—128 **11 Claims**



1. An apparatus including first and second potentiometers, said potentiometers drivable by a control stick comprising:

a housing means;

said first and second potentiometers comprising respective first and second potentiometer housings having respective first and second rotatable shafts mounted therein;

first and second gear means affixed to said first and second potentiometer housings, respectively, said first shaft extending through said first gear means and being rotatable with respect to said first gear means; said second shaft extending through said second gear means and being rotatable with respect thereto;

first and second orthogonal fork member means connected to said first and second shafts, respectively, and mounted in said housing means for rotation through an arc with respect to said housing means; and

means for driving each said gear means pivot the attached potentiometer housing with respect to the shaft mounted therein, thereby adjusting the potentiometer setting corresponding to a particular position of said form means.

4,620,177

WINKER DEVICE

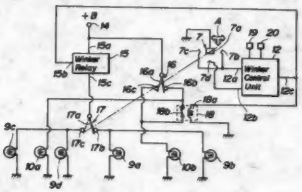
Kaoru Hatanaka, Saitama, and Yukio Miyamaru, Tokyo, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 14, 1985, Ser. No. 691,108

Claims priority, application Japan, Jan. 13, 1984, 59-4601

Int. Cl.[4] B60Q *1/46, 1/00, 1/26*; B62J *6/00*

U.S. Cl. 340—81 R **12 Claims**



12. A winker device, comprising:

a left winker having:

a left winker lamp adpated for a turning to the left; and

a left position lamp;

a right winker having:

a right winker lamp adapted for a turning to the right; and

a right position lamp;

a winker relay connected to a power source, for intermittently supplying an electric power to said left and right winker lamps;

a first select switch interposed between said winker relay and said left and right winker lamps, for connecting said winker relay constantly to either of said left and right winker lamps;

a position lamp relay disposed between said power source and said left and right position lamps, for connecting and disconnecting said power source to and from said left and right position lamps; and

winker switch means for supplying:

in accordance with a manual operation, a first signal to said winker relay and said position lamp relay;

said first signal representing either of said turning to the left and said turning to the right;

and a second signal to said winker relay and said position lamp relay; and

said second signal representing a completed state of said turning;

wherein:

when said first signal is supplied from said winker switch means, at least either of said left and right position lamps is made extinguished in correspondence to said first signal and, when said second signal is supplied from said winker switch means, said either of said left and right position lamps, as extinguished.

4,620,178

DOUBLE INTEGRATING-TYPE ANALOG-TO-DIGITAL CONVERTER

Kazufumi Naito, Ohtsu, Japan, assignor to Kabushiki Kaisha Ishida Koki Seisakusho, Kyoto, Japan

Filed Feb. 16, 1984, Ser. No. 580,690

Claims priority, application Japan, Feb. 16, 1983, 58-025149; Feb. 18, 1983, 58-026642

Int. Cl.[4] H03K *13/02*

U.S. Cl. 340—347 NT **15 Claims**

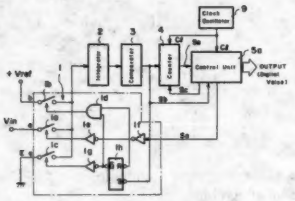
1. A double integrating-type analog-to-digital converter comprising:

switching means, having an output terminal and having an input terminal operatively connected to receive at least a first input signal which is an analog voltage signal to be

measured, and a second input signal which is a reference voltage opposite in polarity to the analog voltage signal, for switching between the first and second input signals;

integrating means, having an input side operatively connected to the output terminal of said switching means and having an output side for outputting an output signal, for integrating the analog voltage over a predetermined integrating interval when said switching means selects the analog voltage signal, and for reverse-integrating the reference voltage when said switching means subsequently selects the reference voltage, until the output signal of said integrating means attained a predetermined value;

counting means, operatively connected to said integrating



means, for measuring the time interval required for the reverse integration performed by said integrating means;

memory means for storing a plurality of different set time intervals; and

control means, operatively connected to said switching means and said counting means, for controlling said switching means and said counting means, said control means having a computer for controlling the predetermined integrating interval of the analog voltage on the basis of a number of steps executed by said computer, the integrating interval being set by said computer and being selected from among said plurality of different set time intervals stored in said memory means, the analog voltage being applied to said integrating means for a period of time equivalent to the integrating interval set by said computer.

4,620,179

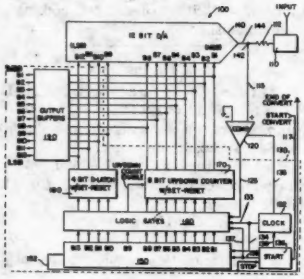
METHOD FOR SUCCESSIVE APPROXIMATION A/D CONVERSION

Frank R. Cooper, West Melbourne, and Kanti Bacrania, Palm Bay, both of Fla., assignors to Harris Corporation, Melbourne, Fla.

Continuation of Ser. No. 527,482, Aug. 29, 1983. This application Aug. 30, 1985, Ser. No. 771,160

Int. Cl.[4] H03M *1/08*

U.S. Cl. 340—347 AD **10 Claims**



1. A method of high speed digitizing of analog input signals to N bit digital numbers in a successive approximation analog to digital converter means having an internal digital to analog converter means and successive approximation register means both scaled for N bits comprising:

a. supplying input signals to be digitized;

b. successively approximating the states of the first X bits, where X is less than N and greater than one, at a rate which provides less than the desired accuracy of conversion for the first X bits of N bits of successive approximation conversion, but which provides at least the desired accuracy of conversion for the last Y bits, where Y plus X equals N;

c. allowing the input signal to settle to at least the desired accuracy for N bits of successive approximation after successively approximating the Xth bit;

d. comparing the input signal to a signal which is representative of said first X bits and digitally incrementing or decrementing at least one of said X bits in response to said comparison to correct for conversion inaccuracies; and

e. successively approximating the states of the last Y bits, at said rate which provides at least the desired accuracy of conversion for said last Y bits, to complete the digitizing process.

4,620,180

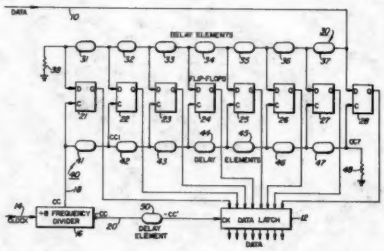
SERIAL-TO-PARALLEL CONVERTER FOR HIGH-SPEED BIT STREAMS

Stephen C. Carlton, Edmonton, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 21, 1985, Ser. No. 789,543

Int. Cl.[4] H03K *13/256*

U.S. Cl. 340—347 DD **11 Claims**



1. A serial-to-parallel converter comprising:

a plurality n of data latches each having a clock input, a data input, and a data output;

first and second delay lines coupled respectively to the data nputs and the clock inputs of the data latches;

means for supplying a serial bit stream having a predetermined bit rate N to one end of the first delay line and a clock signal having a frequency N/n to an opposite end of the second delay line; and

means for deriving parallel bits from the data outputs of the data latches;

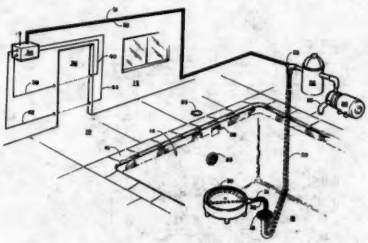
the delay lines comprising delay elements providing delays such that the total delay provided by the two delay lines between the data inputs and the clock inputs of any two aqjacent latches is 1/N, and the total delay provided in each delay line between the respective inputs of the atternate data latches is 1/N.

4,620,181

POOL ALARM SYSTEM

Robert L. Sackett, 2282 #43 Caminito Pescado, San Diego, Calif. 92107

Filed Nov. 9, 1984, Ser. No. 669,896
Int. Cl.[4] G08B *13/00*
U.S. Cl. 340—566 16 Claims



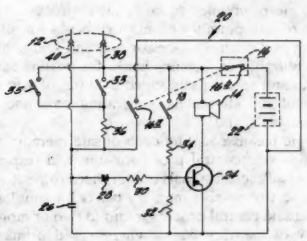
1. A pool alarm system comprising:
a sensing means for sensing water movement;
a first light source;
first optic transmission means extending to said sensing means from said light source;
switching means;
second optic transmission means extending from said sensing means to said switching means for optically operating said switching means response to surface water impact between "on" and "off" states; and
an alarm system connected to said switching means and activated when said switching means is in said "on" state.

4,620,182

SECURITY APPARATUS FOR RETAIL GOODS

Terry A. Keifer, Reading, Pa., assignor to Check Mate Systems, Inc., Reading, Pa.

Filed Jan. 10, 1985, Ser. No. 690,346
Int. Cl.[4] G08B *13/12*
U.S. Cl. 340—568 8 Claims



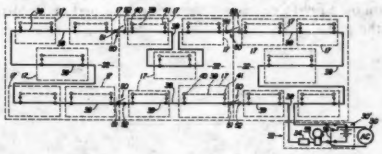
1. A security apparatus, for use with the display of retail items for the prevention of retail theft, comprising:
an alarm mechanism which generates an alarm signal in response to electrical power being applied thereto;
first switch means, interposed between a source of electrical power and said alarm mechanism, for allowing and interrupting the passage of electrical power to said alarm mechanism in response to a switch signal; and
second switch means responsive to a closed circuit, connected electrically between a source of electrical power and said first switch means and capable of mechanical connection to said retail items, for providing a switch signal to said first switch means when said mechanical connection is broken, such that said source does not provide electrical power to said alarm mechanism until said mechanical connection is broken, thereby preserving said source of electrical power, said second switch means including a cable having two insulated conductive elements co-extensive therein, wherein one end of said cable is mechanically connected to said retail item and wherein the other end of said cable has one conductive element electrically connected to said source of electrical power and the other of said conductive elements electrically connected to said first switch means, whereby if said cable is cut, said conductive elements are caused to contact forming a closed circuit between said source of electrical power and said first switch means, thereby providing a switch signal.

4,620,183

ALARM ASSEMBLY FOR JEWELERY-TYPE DISPLAY CASE

Sanders Kottelman, 777-C NW. 29th Ave., DelRay Beach, Fla. 33445

Filed Feb. 13, 1984, Ser. No. 579,416
Int. Cl.[4] G08B *13/14*
U.S. Cl. 340—568 15 Claims



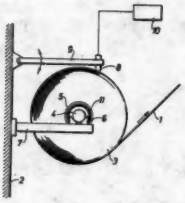
1. An alarm system of the type used in combination with a jewelry-type display case and primarily designed to prevent unathorized removal of articles from the interior thereof, said system comprising:
(a) base means dimensioned and configured for positioning on the interior of a display case and including at least one base element,
(b) said base element including a substrate means and display platform means disposed in supported position on said substrate means, said display platform means structured to substantially define an exposed surface of said base means,
(c) tray means structured to hold and display predetermined articles thereon and positioned in at least partially supported relation on said exposed surface,
(d) circuit means mounted on said base means in communicating relation with said exposed surface and in interconnecting relation to said tray means,
(e) said circuit means comprising conductor segment means secured to said tray means, a signal assembly, a power source, and further including conductor means interconnecting said latter elements in series with one another,
(f) said tray means including said conductor segment means formed thereon and removably positionable in interconnection with said conductor means and electrical communication with said signal assembly and power source, said circuit means structured to cause activation of said signal assembly upon removal of said conductor segment means from interconnection with said conductor means and said tray means from said exposed surface of said display platform means, and said base means comprising a plurality of base elements disposable in interconnected, directly adjacent relation to one another, each base element including base contact means structured to define a position of said circuit means, said base contact means disposable for removable connection with the base contact means of a next adjacent base element.

4,620,184

SENSING ARRANGEMENT ON A MATERIAL ROLL

Ulf Nedstedt, Eslöv, Sweden, assignor to Tetra Pak International AB, Lund, Sweden

Filed Feb. 19, 1985, Ser. No. 702,734
Claims priority, application Sweden, Mar. 7, 1984, 8401246
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—675 9 Claims



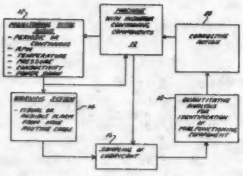
1. An arrangement for sensing thickness of a roll of weblike material, comprising a movable sensing device positioned against a peripheral section of the roll so that at a predetermined distance from the roll center, the sensing device is acted upon by a field-generating element positioned in a central part of the roll.

4,620,185

WEARING PART DIAGNOSTIC SYSTEM EMPLOYING TRACER ELEMENTS

Thomas G. Plahmer, Waukesha, Wis., assignor to Rexnord Inc., Milwaukee, Wis.

Filed Apr. 8, 1985, Ser. No. 721,097
Int. Cl.[4] G08B 21/00
U.S. Cl. 340—682 12 Claims



1. In a system for monitoring a machine having an internal lubrication system and various replaceable wearable components, such that the lubricant is common to all components, the process of monitoring the condition of machine lubricant to pinpoint malfunctioning components comprising:

(a) distributing a distinct trace element indicator material in each wearable component;

(b) establishing acceptable cumulative levels of indicators from all wearable components in said lubricant;

(c) sampling said lubricant; and

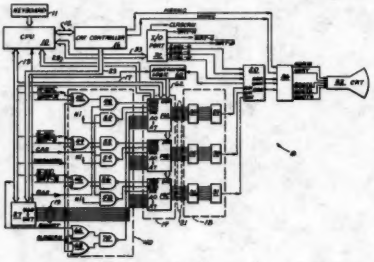
(d) analyzing said sample of said lubricant by means capable of distinguishing between various indicators to detect the presence and changes in the amount of the particular indicator or indicators which signify a specific malfunctioning component.

4,620,186

MULTI-BIT WRITE FEATURE FOR VIDEO RAM

Charles A. Krause, Stevensville, and Babu Rajaram, St. Joseph, both of Mich., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Aug. 30, 1983, Ser. No. 527,943
Int. Cl.[4] G09G 1/28
U.S. Cl. 340—703 1 Claim



1. In a raster scanned color video display system comprised of a video display unit having a matrix of discrete picture elements and three memory banks coupled thereto for the storage of primary color video data therein representing a respective primary color component of each of said discrete picture elements, wherein each memory bank is comprised of a plurality of memory locations arranged in a matrix format and wherein each memory location is designated by a unique row and column address combination, means for simultaneously writing said primary color video data into two or more of said plurality of memory banks comprising:

a central processor unit coupled to each of said memory banks by means of a data bus for writing a respective primary color component of each of said discrete picture elements into each of said memory banks;

a control unit coupled to each of said memory banks and to said central processor unit, for reading said primary color video data therefrom and providing said data to said video display unit;

first logic means coupled to said central processor unit and to each of said plurality of memory banks for alternately coupling said central processor unit and said control unit to said plurality of memory banks for writing said video data into and reading said video data out of said memory banks and for alternately generating row and column address signals; and

second logic means coupling each of said memory banks in parallel to said central processor unit and responsive to memory bank select signals output therefrom representing each of said respective memory banks for simultaneously coupling said central processor unit to two or more of said plurality of memory banks wherein said primary color video data is provided in parallel to two or more of said memory banks at the same time, said second logic means further coupled to said first logic means for providing said row and column address signals to each of said memory banks simultaneously.

4,620,187

TRANSFORMER COUPLED, SOLID STATE COMMUNICATIONS LINE SWITCH

David E. Conner, Cary, N.C., assignor to International Business Machines Corp., Armonk, N.Y.

Filed Dec. 11, 1984, Ser. No. 680,621
Int. Cl.[4] H04Q 3/00; H04J 3/02, 3/00; H04B 3/00
U.S. Cl. 340—825.05 13 Claims

1. In a communications network having a transmission medium operable for transmitting electrical signals provided by one or more DTEs connected to said medium a switching

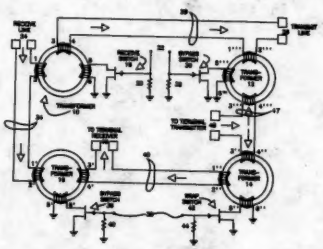
arrangement operable for inserting and/or de-inserting the DTE from the transmission medium comprising:

a first means operable for controlling the flow of electrical signals on the transmission medium;

a second means operable for controlling the flow of electrical signals into and/or from said DTE;

a first conductive means operable for coupling the first and second means to an input side of the transmission medium;

a second conductive means operable for coupling the first means to an output side of said transmission medium;



a third conductive means operable for coupling the second means to the DTE;

a fourth conductive means operable for coupling the second means to the first means; and

control means coupled to the first and second means and operable for selective disabling said first and second means so that electrical signals from a DTE are being transmitted onto the transmission medium or being wrapped from the output of said DTE to its input or signals on said transmission medium are being transmitted into the DTE or are being made to bypass said DTE.

4,620,188

MULTI-LEVEL LOGIC CIRCUIT

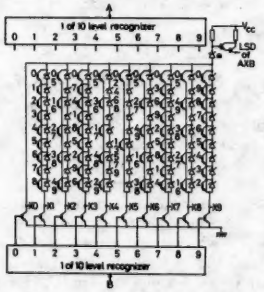
Chanty Sengchanh, Sandringham, New Zealand, assignor to Development Finance Corporation of New Zealand, Auckland, New Zealand

Filed Aug. 13, 1982, Ser. No. 408,118

Claims priority, application New Zealand, Aug. 17, 1981, 198054

Int. Cl.[4] H04Q *1/00*; H03K *19/08*

U.S. Cl. 340—825.87 **7 Claims**



1. A multi-level logic circuit operating in a base n where n is greater than 2, comprising

(a) first logic circuit means including

(1) a first input level detector having one multi-level detector for detecting any one of n logic levels and for producing a first output signal in response to an appropriate input logic level;

(2) a first control switching device connected with said first input level detector for producing a first select signal in response to the output signal from said first level detector; and

(3) a first output level generator connected with said first control switching device for producing in response to said first selected signal an output of logic level (n−1−a), wherein a is the input logic level detected by said first input level detector; and

(b) second logic circuit means including

(1) a second input level detector having a plurality of multi-level input lines arranged so that the highest logic level on one of said input lines is transmitted to the second input level detector which produces a second output signal in response to the highest logic level;

(2) a second control switching device connected with said second input level detector for producing a second selected signal in response to said second output signal; and

(3) a second output level generator connected with said second control switching device for producing in response to said second select signal an output of logic level (n−1−a_x), where a_x is the highest logic level of the input logic levels (a_1, a_2, a_3 . . . a_k) detected by said second input level detector;

said first and second input level detectors each including voltage dependent input switching means, respectively, and said first and second output level generators each including a voltage divider capable of providing n different voltage outputs, respectively.

4,620,189

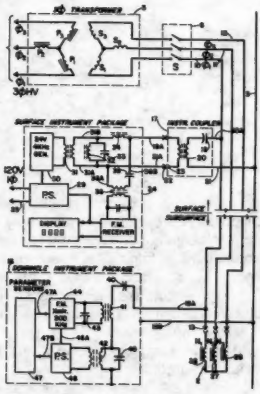
PARAMETER TELEMETERING FROM THE BOTTOM OF A DEEP BOREHOLE

Claude A. Farque, Tulsa, Okla., assignor to Oil Dynamics, Inc., Tulsa, Okla.

Filed Aug. 15, 1983, Ser. No. 523,455

Int. Cl.[4] G01V *1/00*; E21B *29/02, 47/00*

U.S. Cl. 340—856 **14 Claims**



1. In an apparatus for pumping a liquid from a borehole in the earth, including at least a string of tubing from the surface to a selected depth in said borehole, eectric motor means and pump means supported at the bottom end of said tubing, alternating current electrical power supply means at the surface, of a first selected frequency and a multiple conductor cable that is subject to varying resistance or insulation leakage, said cable connected to said power supply means at the surface end, and to said motor means at the bottom end of said cable;

apparatus for use in combination with said multiple conductor cable to measure, in said borehole, at least one well parameter indicative of a condition contiguous to said motor and pump means and transmitting to the surface a signal representative of said at least one well parameter, comprising:

(a) means at the surface for generating an intermediate frequency signal;

(b) electrical coupling means at the surface for connecting said intermediate frequency signal between at least one conductor in said cable and ground;

(c) downhole instrument package means positioned in said borehole and connected to said at least one conductor and ground, said downhole instrument package means including;

(1) power supply means energized by said intermediate frequency signal;

(2) at least one non-eddy current sensor means for sensing said at least one parameter;

(3) means to create a low frequency signal as a function of said parameter;

(4) means to generate a high frequency carrier signal of the order of 200 KHz,

(5) means to modulate said carrier signal with said low frequency signal to create a modulated carrier signal;

(6) means transmitting said modulated carrier signal to said at least one conductor; and

(d) means to demodulate said modulated carrier signal to reconstitute said low frequency signal; and

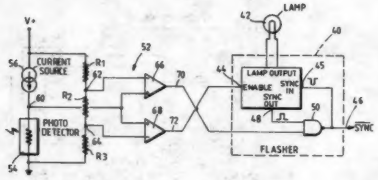
(e) means to indicate said well parameter as a function of said reconstituted low frequency signal.

4,620,190

METHOD AND APPARATUS FOR SIMULTANEOUSLY ACTUATING NAVIGATIONAL LANTERNS

David C. Tigwell, Spring, and Marion L. Recane, Houston, both of Tex., assignors to Tideland Signal Corporation, Houston, Tex.

Filed Jul. 30, 1984, Ser. No. 635,977
Int. Cl.[4] G08G *3/00*
U.S. Cl. 340—985 **8 Claims**



1. In a navigational lantern system having a plurality of navigational lanterns, each lantern including means for providing a synchronizing signal, each lantern including a synchronizing terminal for actuating the lantern, and the input and output from each lantern connected to the synchronizing terminal of the other lanterns, and a light level sensing means connected to each lantern, the improvement in the light level sensing means comprising,

each light level sensing means sensing the thresholds of day, twilight, and night,

means connected to the sensing means, when the sensing means senses day, for disabling the connected lantern and disabling the means for providing a synchronizing signal from the connected latern,

means connected to each sensing means, when the sensing means senses twilight, enabling the connected lantern to receive a synchronizing signal, but disabling the means for providing a synchronizing signal from the connected lantern, and

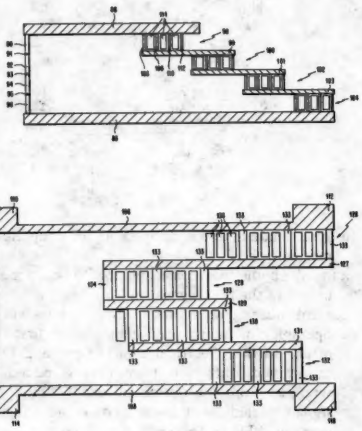
means connected to each sensing means, when the sensing means senses night, enabling the connected lantern for lighting, and enabling the means for providing a synchronizing signal from the connected lantern.

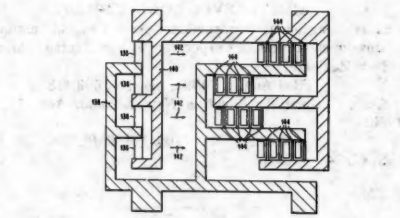
4,620,191

SURFACE ACOUSTIC WAVE PASSIVE TRANSPONDER HAVING PARALLEL ACOUSTIC WAVE PATHS

Halvor Skeie, 3338 Pearltone Dr., San Jose, Calif. 95117

Filed Jun. 30, 1983, Ser. No. 509,525
Int. Cl.[4] G01S *13/80*; H03H *9/21, 9/205*
U.S. Cl. 343—6.8 R **9 Claims**





1. In a passive transponder adapted for use in an interrogation system for transmitting a reply signal containing coded information in response to the receipt of an interrogating signal, said transponder comprising:

(a) a substrate having a substrate surface defining paths of travel for surface acoustic waves;

(b) at least one launch transducer arranged on said surface for converting said interrogating signal into surface acoustic waves which propagate along said paths of travel;

(c) a plurality of tap transducers arranged on said surface at spaced intervals along said paths of travel for converting said surface acoustic waves into respective output signals; and

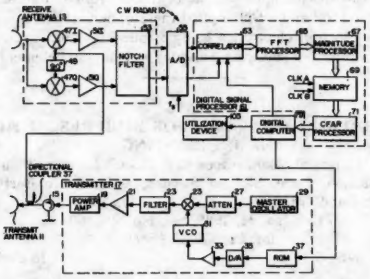
(d) circuit means connected to said tap transducers for combining said output signals to form said reply signal;

the improvement wherein said tap transducers are arranged acoustically both in series and in parallel along said paths of travel.

4,620,192
CONTINUOUS WAVE RADAR WITH RANGING CAPABILITY

John D. Collins, Burlington, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Sep. 29, 1983, Ser. No. 537,475
Int. Cl.[4] G01S *13/26*
U.S. Cl. 342—128 1 Claim



1. A frequency modulated continuous wave radar adapted to determine the range of a target by measuring the propagation delay of echo signals therefrom, such radar comprising:

(a) a transmitter for continuously emitting a beam of radio frequency energy with repetitive linearly varying modulation, the period of such modulation being equal to, or greater than, the largest propagation delay;

(b) a receiver for converting all received signals to baseband signals and for passing only signals having a frequency above a predetermined frequency;

(c) first means, responsive to the signals out of the receiver, for converting such signals to a first plurality of sets of complex digital numbers representative of echo signals from a target during each modulation period and for storing such sets of complex digital numbers;

(d) a read only memory means storing a set of complex digital numbers representative of the modulation waveform, as modified by the receiver, of the transmitted signal;

(e) a digital correlator, responsive repetitively to the complex digital numbers in the first plurality of stored sets of complex digital numbers and to the set of complex digital numbers in the read only memory means, such latter set being repetitively read with differing delays with respect to the modulation waveform on the transmitted signal, for producing a second plurality of differently correlated signals in the form of sets of complex digital numbers having the format $Ir \pm Qi$ where I and Q are the real and imaginary parts of the complex digital numbers out of the first means and r and i are the real and imaginary parts of the complex digital numbers out of the first means and r and i are the real and imaginary parts of the complex digital numbers out of the read only memory means;

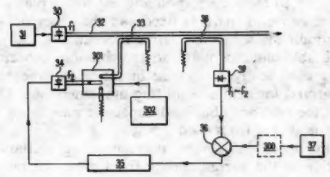
(f) Fourier transforms means, responsive to the correlated signals, for producing a like plurality of frequency spectra; and

(g) second means, responsive to the frequency spectra out of the Fourier transform means, for calculating the propagation delay of the most correlated signals.

4,620,193
OPTICAL PHASE ARRAY RADAR

John S. Heeks, Old Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Jun. 11, 1984, Ser. No. 619,653
Claims priority, application United Kingdom, Jun. 16, 1983, 8316414
Int. Cl.[4] G01S *13/00*
U.S. Cl. 342—200 10 Claims



1. In an optically controlled phased array radar, the combination comprising: a plurality of sources of optical carriers; a plurality of antenna elements; a central processor; and a plurality of individual optical waveguide transmission links connecting said central processor to said antenna elements to transmit said optical carriers thereto, said central processor controlling the operation of said antenna elements by microwave signals impressed upon said optical carriers, each of said links including means for monitoring the microwave frequency phase shift introduced by that link to provide a compensation signal, said compensation signal being used to regulate the optical path length of that link.

4,620,194
TUNABLE ANTENNA WITH VARIABLE SERIES L–C NETWORK

Joaquin Bel Moratalla, 4 & 6 Carmen Street, Badalona (Barcelona), Spain

Filed Nov. 4, 1983, Ser. No. 548,574
Claims priority, application Spain, Nov. 16, 1982, 517418
Int. Cl.[4] H01Q *1/08, 9/04*
U.S. Cl. 343—747 7 Claims

1. Emitting and receiving antenna system for accommodating all bands and frequencies within a given range and for operating selectively adjustably in resonance at a given emitting or receiving frequency, comprising:

at least one antenna component containing therewithin a variable inductor having a fixed inductor part and a shiftable inductor part arranged for selectively varying the inductance upon selectively shifting the shiftable inductor part relative to the fixed inductor part, and a variable capacitor having a fixed capacitor part and a shiftable capacitor part arranged for correspondingly selectively varying the capacitance upon correspondingly selectively shifting the shiftable capacitor part relative to the fixed capacitor part.

drive means arranged for shifting the shiftable inductor part relative to the fixed inductor part and conjointly for shifting the shiftable capacitor part relative to the fixed capacitor part, and

control means arranged for controlling the drive means for selectively shifting the shiftable inductor part and the shiftable capacitor part conjointly for achieving selective

antenna resonance tuning at an exact point corresponding to the desired operating band and frequency,

the inductor and capacitor being arranged in longitudinal end to end relation within said at least one antenna component, and including an inductor friction runner part and an inductor coil part in operative friction contact therewith, one of which inductor parts is fixed and the other of which is longitudinally shiftable relative thereto, and a capacitor outer concentric tubular part and a capacitor inner concentric stud part in radialiy spaced relation to each other whereby to form corresponding capacitor plates, one of which capacitor parts is fixed and the other of which is longitudinally shiftable relative thereto,

the shiftable inductor part and the shiftable capacitor part being electrically connected in series and mechanically connected for common shifting movement, and the fixed inductor part and the fixed capacitor part being electrically insulated from each other,

whereby upon shifting the corresponding shiftable parts relative to the corresponding fixed parts the inductance and capacitance will be varied directly and the frequency will be varied inversely.

4,620,195

METHOD OF FABRICATING AN INK DROPLET GENERATOR FOR AN INK JET PRINTER AND INK DROPLET GENERATOR FABRICATED THEREBY

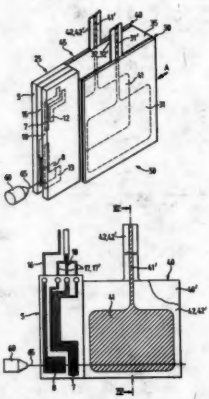
Otto Eblen, Constance; Gerhard Glöckler, Orsingen; Franz Kohler, Meersburg, and Norbert Meinusch, Stockach, all of Fed. Rep. of Germany, assignors to Contraves GmbH, Haar/-Munich, Fed. Rep. of Germany

Filed Feb. 11, 1985, Ser. No. 700,522

Claims priority, application Switzerland, Feb. 27, 1984, 939/84

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **21 Claims**



1. A method for fabricating components of an ink droplet generator for generating a succession of charged, detected and deflected ink droplets for an ink jet printer, comprising the steps of:

removing unrequired electrical conductive coating from metallically coated elements to form a desired configuration of mutually isolated means for charging, detecting and deflecting ink droplets;

configuring a first means of said means as charging electrodes, a second means of said means as detection electrodes and a third means of said means as deflection electrodes;

applying a surface medium resistant to organic and inorganic media at least to a side of each of said first, second and third means which is wetted by an ink droplet medium of the ink jet printer;

said charging electrodes and said detection electrodes being formed upon a first surface of a double-sided coated support element;

a metallic coating of a second surface of said double-sided coated support element being configured and employed as electromagnetic shielding for said charging electrodes and said detection electrodes;

said deflection electrodes being formed, conjunctively with therewith associated conductor traces, from a single-sided coated foil and a foil applied thereto; and

said deflection electrodes being applied in sandwich construction to a substrate provided as a support element.

4,620,196

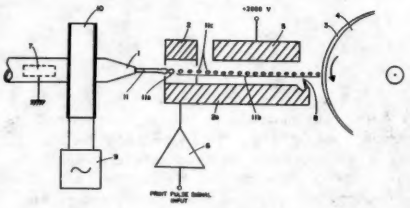
METHOD AND APPARATUS FOR HIGH RESOLUTION INK JET PRINTING

Carl H. Hertz, Skolbänksvägen 8, S-223 67 Lund, and Bo Å. Samuelsson, Lund, both of Sweden, assignors to Carl H. Hertz, Lund, Sweden

Filed Jan. 31, 1985, Ser. No. 696,690

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—1.1 **18 Claims**



10. In an improved method for depositing an amount of a printing fluid of at least one color onto a pixel said pixel being in a predetermined position on a recording medium;

forming droplets of ssid fluid at a drop formation point using a droplet formation means comprising at least one nozzle means to create at least one liquid jet of fluid;

charging using at least one droplet charging means said droplets substantially at said drop formation point with a predetermined and appropriate voltage level sufficient to reduce droplet merging;

controlling a location of said drop formation point;

intercepting droplets not being deposited onto said pixel using a dropledt interceptor means said interceptor means comprising at least one droplet directing electrode means and a droplet catcher means, said droplet directing electrode means used for applying a charge of sufficient magnitude to cause those droplets to be intercepted to be delfected into said droplet catcher means;

vibrating said droplet formation means using a vibrator means driven by a signal of predetermined amplitude and frequency and disposed relative to said at least one nozzle means to generate substantially uniformly sized and uniformly spaced droplets said amplitude also influencing said drop formation point location;

said improvement comprising in combination:

controlling said deposited amount of printing fluid by controlling the number of said droplets, said number being a predetermined number of said droplets, said predetermined number of droplets dependent upon at least one color density to be recorded and controllably deposited within said pixel whereby each such pixel having said predetermined number of droplets therein contributes toward the creation of a specific density of printing fluid.

4,620,197

INK JET RECORDING METHOD

Shigehiko Miyamoto, Kamagaya; Yoshinobu Watanabe, Matsudo, and Yuriko Kishi, Misato, all of Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

Filed Sep. 15, 1983, Ser. No. 532,512

Claims priority, application Japan, Sep. 17, 1982, 57-163032

Int. Cl.[4] G01D *15/16;* B05D *5/00;* B32B *7/00;* C09D *11/00*

U.S. Cl. 346—1.1 4 Claims

1. In an ink jet recording method which comprises coating an aqueous solution on a surface of a base paper and drying it to obtain a recording sheet and thereafter printing a water-base ink on the aqueous solution-coated surface of the recording sheet, the improvement comprising employing an aqueous solution which contains a cationic fluorescent agent and wherein said water-base ink contains either a water-soluble substantive dye or a water-soluble acid dye.

4,620,198

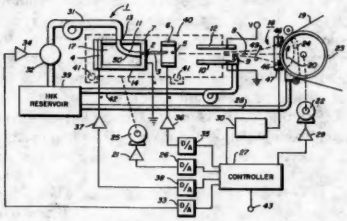
MULTICOLOR INK JET PRINTHEAD

Eugene Behun, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 20, 1985, Ser. No. 799,993

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—75 9 Claims



1. An improved multicolor ink jet printhead for use in a continuous stream ink jet printer of the type having a reciprocating printhead mounted on a movable carriage, the printhead having a droplet generator with at least one nozzle for each color of ink to be printed for respectively producing a single, perturbed continuous stream of ink under pressure that breaks up into droplets at a predetermined distance from the nozzle whereat the droplets are charged in accordance with digitized data signals from a controller for printing swaths of information on a recording medium by sweeping a predetermined series of droplets in one direction while the droplet generator is reciprocated in another direction and repeating the carriage reciprocation and droplet sweeping until a completed page of information is printed in color one swath at a time, the recording medium being incrementally moved a distance equal to the height of one printed swath by a platen after each swath is printed, wherein the improved ink jet printhead comprises:

a droplet generator body having an internal cavity therein filled with a predetermined medium, the droplets generator body having a plurality of inlet ports and an outlet port for each inlet port, each inlet port connecting the cavity to a separate, different colored ink supplied thereto from an ink supply under a predetermined pressure;

a nozzle plate being sealingly positioned over the outlet ports and having one nozzle for each outlet port therein, each nozzle being in communication with the droplet generator body cavity through its outlet port;

an acoustic driver being mounted on the droplet generator body for perturbating the medium filling the cavity of the droplet generator body; and

means for sealingly interconnecting each inlet port with a one of the outlet ports, said interconnecting means providing individual passageways of each colored ink entering its respective inlet port and traveling through the medium contained in the droplet generator body cavity to its respective outlet port and separating the ink from the cavity medium as it travels therethrough to its respective nozzle and exits therefrom in a stream of ink, so that only one droplet generator body and only one acoustic driver are required to perturbate simultaneously several different colored ink streams emitted from the printhead.

4,620,199

THERMAL TRANSFER COLOR PRINTER

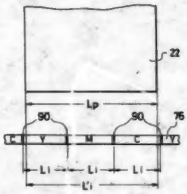
Hisao Tatsumi; Haruhiko Kayata, both of Nagoya, and Fumio Watanabe, Yokohama, all of Japan, assignors to Kabuskiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 13, 1984, Ser. No. 650,078

Claims priority, application Japan, Sep. 16, 1983, 58-144163[U]; Sep. 21, 1983, 58-147009[U]

Int. Cl.[4] G01D *15/10*

U.S. Cl. 346—76 PH 10 Claims



7. A thermal transfer color printer having a carriage moving mechanism, a thermal head moving mechanism, and a ribbon feeding mechanism, said printer comprising:

(a) a thermal ink ribbon having different color materials each having a predetermined equal section;

(b) a thermal head for transferring the color materials to a print paper;

(c) a color sensor for detecting each color material disposed on each section of said ink ribbon;

(d) a carriage carrying said thermal head, a cassette and said color sensor and movable relative to the print paper in accordance with the movement of the carriage moving mechanism, said cassette removably mounted on said carriage and storing the thermal ink ribbon of multi-colors; and

(e) a control unit including a microprocessor having a CPU, a ROM, and a RAM and for controlling the carriage moving mechanism, the thermal head moving mechanism, and the ribbon feeding mechanism in accordance with detected signals from the color sensor and print information received by said printer, said color sensor being arranged such that the distance from said color sensor to said thermal head along said thermal ink ribbon is substantially equal to the length of said each predetermined section of the ink ribbon in the direction of feed, the combined length of two or more different said predetermined equal sections for the color materials of said thermal ink ribbon being set at the maximum distance which the thermal head can move.

4,620,200

SCAN BEAM VELOCITY-COMPENSATION RECORDING SYSTEM

Nobutaka Fukai, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Japan

Filed Sep. 26, 1985, Ser. No. 780,667

Claims priority, application Japan, Oct. 8, 1984, 59-210660

Int. Cl.[4] G01D *15/14, 9/42;* H04N *1/22;* G03G *15/00*

U.S. Cl. 346—108 4 Claims

1. A recording medium scanning system comprising:

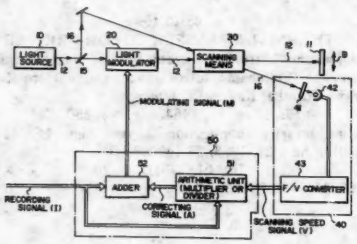
(i) a light source for generating a scanning light beam;

(ii) a light modulator for modulating said light beam with a modulating signal;

(iii) scanning means for scanning a recording medium with the modulated light beam emitted from said light modulator;

(iv) scanning speed detecting means for detecting the scanning speed of a light beam emitted from said scanning means to issue a scanning speed signal indicative of the detected scanning speed; and

(v) arithmetic means for effecting an arithmetic operation on the scanning speed signal issued from said scanning speed detecting means and a recording signal and for applying the result of said arithmetic operation as said modulating signal to said light modulator.



4,620,201

MAGNETIC DRIVER INK JET

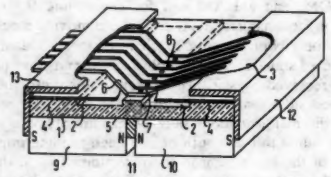
Joachim Heinzl, Munich; Hans-Dieter Penningsfeld, Freising, and Peter Berdelle-Hilge, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 3, 1986, Ser. No. 815,922

Claims priority, application Fed. Rep. of Germany, Jan. 14, 1985, 3500985

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **11 Claims**



1. An arrangement for generating individual droplets in an ink printer device, having a common ink chamber for a plurality of discharge openings, and having a plurality of conductor loops with web portions corresponding in number to the plurality of said discharge openings, said conductor loops being secured at both sides of said ink chamber and their middle parts being movable in the region of said ink chamber, and including a magnet system whose magnetic field penetrates at least the webs of said conductor loops, comprising the improvement of said discharge openings being fashioned as breaches in said middle part of every conductor loop and in that, for the ejection of an individual droplet, said movable middle parts execute a movement opposite the ejection direction of an ink droplet.

4,620,202

INK JET PRINTER OF THE INK-ON-DEMAND TYPE

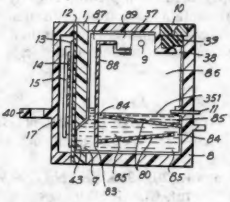
Haruhiko Koto; Junichi Okada; Hiroshi Ishii, and Kenji Sawada, all of Shiojiri, Japan, assignors to Seiko Epson Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 541,628, Oct. 13, 1983, abandoned. This application Aug. 12, 1985, Ser. No. 764,699

Claims priority, application Japan, Oct. 14, 1982, 57-180176; Dec. 7, 1982, 57-215263; Jan. 17, 1983, 58-5501; Jul. 12, 1983, 58-126668; Jul. 20, 1983, 58-132162; Aug. 23, 1983, 58-153660

Int. Cl.[4] G01D *15/18*

U.S. Cl. 346—140 R **7 Claims**



1. An ink-on-demand type ink jet printer comprising a printer head and an ink container, said printer head including nozzles for ejecting ink droplets therethrough, pressure chambers for pressurizing ink therein, and ink passageways for supplying ink from said ink container into said pressure chambers, said printer head being movable in a linear direction for printing across a sheet of recording paper, said ink container having a vertical partition, said vertical partition having a wall disposed adjacent to an outlet of said ink container and extending substantially perpendicularly to said direction of movement of said printer head, said ink container having an interior divided by said vertical partition into a main chamber of a first volume defined between one wall surface of said vertical partition and a wall surface of said ink container, and an auxiliary chamber of smaller volume defined between the opposite wall surface of said vertical partition and another wall surface of said ink container, said ink container being movable with said printer head, said ink being supplied to said nozzles from said auxiliary chamber, the level of ink in said auxiliary chamber being different than the level of ink in said main chamber.

4,620,203

ELECTROSTATIC IMAGE FORMING APPARATUS USING FIELD EFFECT TRANSISTORS

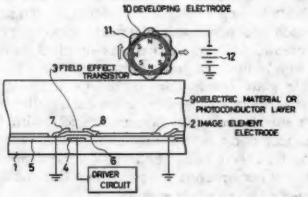
Kaname Nakatani, Osaka, and Yoshiaki Kato, Ikaruga, both of Japan, assignors to Mita Industrial Co., Ltd., Osaka, Japan

Filed Nov. 27, 1985, Ser. No. 802,329

Claims priority, application Japan, Nov. 30, 1984, 59-251658

Int. Cl.[4] G01D *15/06*

U.S. Cl. 346—153.1 **4 Claims**



1. An electrostatic image forming apparatus comprising a layer composed of a dielectric material or a photoconductor,

image element electrodes arranged in the form of a matrix on one surface of said layer, field effect transistors affiliated with the image element electrodes and interposed between the image element electrodes, and a developing electrode arranged on the other surface of the dielectric material or photoconductor layer, to which a voltage is applied.

4,620,204

TWO-COLOR THERMOSENSITIVE RECORDING MATERIAL

Norihiko Inaba, Numazu, and Kiyotaka Iiyama, Mishima, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Oct. 9, 1985, Ser. No. 785,714
Claims priority, application Japan, Oct. 9, 1984, 59-213038
Int. Cl.[4] B41M *5/18*
U.S. Cl. 346—204 **10 Claims**

1. In a two-color thermosensitive recording material capable of forming two different colors when heated at different temperatures, selected from the group consisting of a two-color thermosensitive recording material comprising (a) a support material, (b) a high temperature color-forming layer formed on the support material, comprising a leuco dye, a color developer capable of inducing color formation in the leuco dye to produce a high temperature color when heated to a predetermined high temperature, and a decolorizing agent, (c) an intermediate layer formed on the high temperature color-forming layer and (d) a low temperature color-forming layer formed on the intermediate layer, comprising a leuco dye and a color developer capable of inducing color formation in the leuco dye to produce a low temperature color when heated to a predetermined low temperature, said low temperature color being decolorized by said decolorizing agent contained in said high temperature color-forming layer when heated to a predetermined temperature beyond said predetermined low temperature; a two-color thermosensitive recording material comprising (a) a support material, (b) a high temperature color-forming layer formed on the support material, comprising a leuco dye and a color developer capable of inducing color formation in the leuco dye to produce a high temperature color when heated to a predetermined high temperature, (b) a decolorizing layer formed on the high temperature color-forming layer, comprising a decolorizing agent, (c) an intermediate layer formed on the decolorizing layer and (d) a low temperature color-forming layer formed on the intermediate layer, comprising a leuco dye and a color developer capable of inducing color formation in the leuco dye to produce a low temperature color when heated to a predetermined low temperature, said low temperature color being decolorized by said decolorizing agent contained in said decolorizing layer when heated to a predetermined temperature beyond said predetermined low temperature; and a two-color thermosensitive recording material comprising (a) a support material, (b) a decolorizing and color developing layer formed on the support material, comprising a color developer, (c) an intermediate layer formed on the decolorizing and color developing layer and (d) a two-color thermosensitive coloring layer capable of yielding two different colors when heated at different temperatures, comprising a first leuco dye and a first color developer for inducing color formation in said leuco dye when heated to a predetermine low temperature to produce a low temperature color, and a second leuco dye which is colored in reaction with said color developer contained in said decolorizing and color developing layer when heated to a predetermined high temperature to produce a high temperature color, said low temperature color being decolorized by said color developer contained in said decolorizing and color developing layer when heated to a predetermined temperature beyond said low temperature temperature, the improvement wherein said intermediate layer comprises as the main component a vinylidene chloride resin.

4,620,205

TWO-COLOR THERMOSENSITIVE RECORDING MATERIAL

Kiyotaka Iiyama, Mishima, and Nirohiko Inaba, Numazu, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Sep. 30, 1985, Ser. No. 781,885
Claims priority, application Japan, Oct. 3, 1984, 59-207612
Int. Cl.[4] B41M *5/00*
U.S. Cl. 346—204 **13 Claims**

1. A two-color thermosensitive recording material, comprising:

a support material;

a high temperature color-forming layer comprising a first leuco dye and a first color developer each having a melting point of at least 150° C.;

a decolorizing layer containing a decolorizing agent having a melting point in the range of 120° C. to 160° C. overlaying the high temperature color-forming layer; and

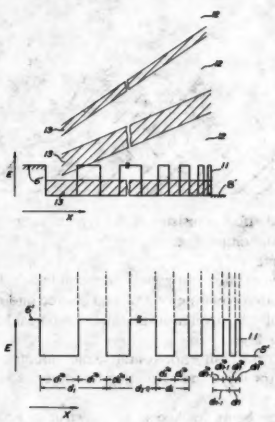
a low temperature color-forming layer comprising a second leuco dye and a second color developer each having a melting point of at least 60° C. with the melting point of at least one of said second leuco dye or second color developer being no more than 130° C.

4,620,206

SEMICONDUCTOR DEVICE

Kimihiro Ohta, Kashiwa; Tadashi Nakagawa, Sakura; Naoyuki Kawai, Yatabe; Takeshi Kojima, Kashiwa, and Mitsuo Kawashima, Toride, all of Japan, assignors to Agency of Industrial Science and Technology, Tokyo, Japan

Filed Feb. 9, 1984, Ser. No. 578,574
Claims priority, application Japan, Jul. 26, 1983, 58-136171
Int. Cl.[4] H01L *27/12, 29/161*
U.S. Cl. 357—4 **26 Claims**



1. A semiconductor device comprising

a superlattice semiconductor portion having first and second ends and including a plurality of laminated pairs of semiconductor thin films arranged along an axis perpendicular to the interface thereof thereby forming a potential profile along said axis determined by the stepped differences between the band edge energies of the thin films forming each of said pairs, said potential profile having virtual miniband and minigap energy states associated therewith and being defined by at least one of the thickness, chemical composition and dopant materials of said thin films, at least one of the thickness, chemical composition and dopant materials of said thin films being modulated in the direction of said axis whereby said miniband and minigap

energy states are monotonically changed in the direction of said axis for every pair of said thin films; and

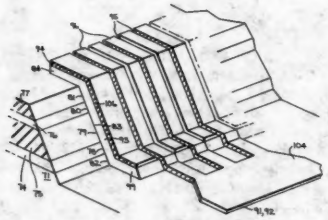
electrodes coupled to the first and second ends of said superlattice semiconductor portion for applying an electric field thereacross.

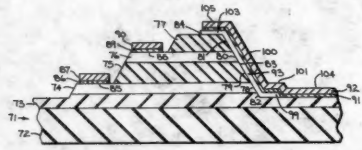
4,620,207

EDGE CHANNEL FET

Joseph A. Calviello, Kings Park, N.Y., assignor to Eaton Corporation, Cleveland, Ohio

Filed Dec. 19, 1984, Ser. No. 683,722
Int. Cl.[4] H01L *49/02*
U.S. Cl. 357—22 13 Claims





1. A field effect transistor of the type having a source, a gate and a drain, comprising:

a substrate;

a first generally horizontal semiconductor layer on said substrate providing one of said source and drain;

a generally horizontal insulator layer on said first semiconductor layer;

a second generally horizontal semiconductor layer on said insulator layer and providing the other of said source and drain;

said layers being stacked as a mesa structure having a generally vertical side exposing the edges of said layers;

a third semiconductor layer having a generally vertical section extending along said side of said mesa over said exposed edges of said first and second semiconductor layers and said insulator layer and providing a channel, said third semiconductor layer having a generally horizontal section on said substrate adjacent said first semiconductor layer; and

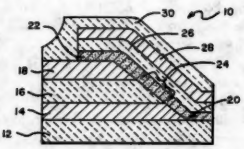
a gate layer having a generally vertical section on at least a portion of said vertical section of said third semiconductor layer over said first semiconductor layer, said gate layer having a generally horizontal section on said horizontal section of said third semiconductor layer, said gate layer having a second generally horizontal section on said substrate.

4,620,208

HIGH PERFORMANCE, SMALL AREA THIN FILM TRANSISTOR

Hellmut Fritzsche, Chicago, Ill., and Robert R. Johnson, Franklin, Mich., assignors to Energy Conversion Devices, Inc., Troy, Mich.

Filed Nov. 8, 1983, Ser. No. 549,996
The portion of the term of this patent subsequent to Oct. 15, 2002, has been disclaimed.
Int. Cl.[4] H01L *29/78*
U.S. Cl. 357—23.1 26 Claims



1. A thin film field effect transistor of the type formed on a substantially planar substrate, said transistor comprising:

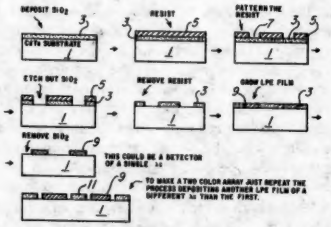
a plurality of layers, said plurality of layers being formed over said substrate so as to have faces substantially parallel to said substrate to form a source region layer, a drain region layer, and an electrically insulating layer between said source and drain regions layers, said layers having edge portions forming a substantially planar surface which is non-parallel to said substrate; a deposited semiconductor material layer overlying said non-parallel surface between and electrically coupled to said source region layer and said drain region layer along said non-parallel surface for forming a current conduction channel therebetween; a gate insulator disposed over said deposited semiconductor material layer and a gate electrode separated from said deposited semiconductor material layer by said gate insulator.

4,620,209

MOSAIC PATTERN OF INFRARED DETECTORS OF DIFFERENT CUT OFF WAVE LENGTHS

Sidney G. Parker, Dallas, and Rudy L. York, Plano, both of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Sep. 28, 1984, Ser. No. 656,059
Int. Cl.[4] H01L *27/14*
U.S. Cl. 357—30 4 Claims


DEPOSIT SiO2
RESIST
PATTERN THE RESIST
ETCH OUT SiO2
REMOVE RESIST
DEPOSITE FILM
REMOVE SiO2
THIS COULD BE A DETECTOR OF A SINGLE
TO MAKE A TWO COLOR ARRAY JUST REPEAT THE PROCESS DEPOSITING ANOTHER LPE FILM OF A DIFFERENT
THAN THE FIRST.

1. In an infrared detector comprising:

(a) a substrate,

(b) a first layer of HgCdTe on said substrate in a predetermined focal plane; and

(c) a second layer of HgCdTe on said substrate spaced from said first layer, having a ratio of Hg to Cd different from said first layer and in said predetermined focal plane.

4,620,210

PHOTOTRANSISTOR OF THE TYPE HAVING AN EMITTER-BASE HETEROJUNCTION

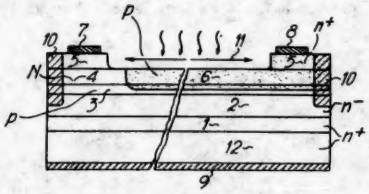
André Scavennec, 8, rue Emilie Deslandres, 75013 Paris, and David Ankri, 86, rue de l'Amiral Roussin, 75015 Paris, both of France

Continuation-in-part of Ser. No. 298,385, Sep. 1, 1981. This application Aug. 17, 1984, Ser. No. 642,135

Claims priority, application France, Sep. 11, 1980, 80 19621

Int. Cl.[4] H01L *27/14, 31/00*

U.S. Cl. 357—30 **4 Claims**



1. A phototransistor comprising a substrate, a collector layer disposed on said substrate, a base layer disposed on said collector layer, an emitter layer disposed on said base layer, said base layer being of a first composite III–V semiconductor material with a first type of doping and said emitter layer of a second composite III–V semiconductor material, a diffusion well of said first type of doping extending on a main part of said emitter layer down to said base layer, a remainder part of said emitter layer being of a second type of doping, said main part of emitter layer with said diffusion well having an area of at least 100 times larger than the area of said remainder part, said collector layer having said second type of doping, a contact layer with said second type of doping on said remainder part of said emitter layer, an emitter contact on said contact layer, a base contact on an extremity of said diffusion well and a collector contact connected to said collector layer, said phototransistor thus comprising a homojunction photodiode under said diffusion well, said diffusion well being transparent in most of its thickness to light radiation to be detected to perform optical and electronic functions.

4,620,211

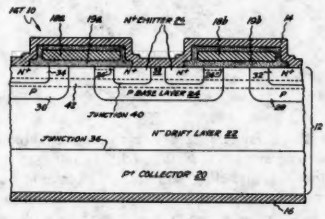
METHOD OF REDUCING THE CURRENT GAIN OF AN INHERENT BIPOLAR TRANSISTOR IN AN INSULATED-GATE SEMICONDUCTOR DEVICE AND RESULTING DEVICES

Bantval J. Baliga; Victor A. K. Temple, both of Clifton Park, and Tat-Sing P. Chow, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Aug. 13, 1984, Ser. No. 640,280

Int. Cl.[4] H01L *29/74, 29/78, 29/167*

U.S. Cl. 357—38 **7 Claims**



1. An insulated-gate power semiconductor device comprising:

(a) a semiconductor drift layer of one conductivity type;

(b) a collector layer of opposite type conductivity adjacent said drift layer;

(c) a semiconductor base region of opposite conductivity type situated in said drift layer and forming a base drift junction therewith;

(d) a semiconductor emitter region of said one conductivity type situated in said base region and forming an emitter-base junction therewith, said semiconductor emitter region, said semiconductor base region and said semiconductor drift layer including portions forming a first surface of said device;

(e) an insulated-gate electrode contiguous with said base region, said insulated-gate electrode, only when appropriately biased, including a channel in said base region beneath said insulated-gate electrode, said channel conductively coupling one type conductivity carriers from said emitter region to said drift region during gate induced forward conduction in said semiconductor device and said insulated-gate electrode, when unbiased or reverse biased, repressing said channel to decouple said drift and emitter regions to render said device nonconductive and inhibit the flow of said one type conductivity carriers from said emitter region to said drift region; and

(f) a layer of recombination centers contained within a region of semiconductor material comprising a portion of said emitter and base regions, said recombination centers being effective to inhibit the injection of one conductivity type carriers from said emitter region into the base region and the transport of one type carrier through the base region so as to reduce current gain at high current levels and said layer of recombination centers exhibiting a peak concentration situated beneath said first surface of said device at said emitter-base junction to within a tolerance of about 20 percent of the thickness of said emitter region, said layer of recombination centers being spaced from said base drift junction.

4,620,212

SEMICONDUCTOR DEVICE WITH A RESISTOR OF POLYCRYSTALLINE SILICON

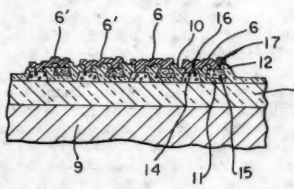
Kazuo Ogasawara, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed May 25, 1983, Ser. No. 498,030

Claims priority, application Japan, May 28, 1982, 57-90611; May 28, 1982, 57-90612

Int. Cl.[4] H01L *27/02*

U.S. Cl. 357—51 **9 Claims**



1. A semiconductor device comprising a first insulating film formed on a semiconductor substrate; a first group of first unit resistor elements made of a first layer of polycrystalline silicon formed on and attached to said first insulating film, the first unit resistor elements being arranged in parallel with each other and extending in one direction, each of said first unit resistor elements being formed with contact portions at opposite ends thereof; a second insulating film formed over said first unit resistor elements and over the surface of said first insulating film between said first unit resistor elements; a second group of said unit resistor elements made of a second layer of polycrystalline silicon formed on said second insulating film,

said second unit resistor elements being arranged in parallel with said first unit resistor elements, each of said second unit resistor elements being formed with contact portions at opposite ends thereof; said first unit resistor elements and said second unit resistor elements being alternately arranged, each of said second unit resistor elements being entirely separated from the adjacent first unit resistor element with a predetermined minimum distance between them when viewed in plan view so that no portion of said second unit resistor elements overlies said first unit resistor elements; a plurality of groups of wiring layers for providing connections between said contact portions at one ends of said first unit resistor elements and said contact portions at corresponding ends of said second unit resistor elements, and between said contact portions at the other ends of said first unit resistor elements and the contact portions at the corresponding other ends of said second unit resistor elements, respectively; a first input/output conductor connected to said contact portion of one unit resistor element selected from among said first and second groups of unit resistor elements; and a second input/output conductor connected to said contact portion of another unit resistor element selected from among said first and second groups of unit resistor elements, whereby said first and second groups of unit resistor elements are formed into a single resistor.

4,620,213

DEEP-GRID SEMICONDUCTOR DEVICE

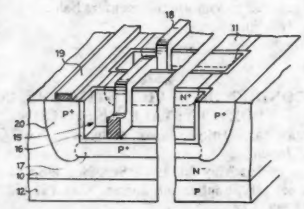
Jacques Arnould, and Eugène Tonnel, both of Paris, France, assignors to Thomson-CSF, Paris, France

Continuation of Ser. No. 253,265, Apr. 13, 1981. This application Dec. 29, 1983, Ser. No. 566,963

Claims priority, application France, Apr. 14, 1980, 80 08271

Int. Cl.[4] H01L *29/06, 23/48, 29/44, 29/52*

U.S. Cl. 357—55 **2 Claims**



1. A diode structure that may be rendered non-conductive even when forwardly biased, comprising:

a central monocrystalline semiconductor layer of a first conductivity type that is doped to a first doping level,

an upper semiconductor layer of said first conductivity type that is doped to a second level higher than said first doping level, said upper layer having an upper surface which constitutes a first major face of the structure,

a lower semiconductor layer of a second conductivity type opposite to said first conductivity type, said lower layer having a lower face which constitutes a second major face of the substrate, there being grooves extending from said first major face through said upper layer and inside said central layer, each groove having wall portions and a bottom portion,

an insulating layer entirely coating said wall portions and bottom portion, the insulating layer having a U-shape inside the groove,

a continuous coating of conductive material on a major part of said upper surface and being in contact with said upper layer between said grooves and with said insulating layer on the wall and bottom portions of the grooves, said coating of conductive material having a U-shape inside each groove whereby the groove is not entirely filled with conductive material and/or insulating material,

a buried zone of said second conductivity type formed within said central layer, adjacent to said bottom portion of each groove, said buried zone comprising separate individual portions each located precisely under a groove and having a high doping level, and

means for electrically accessing said buried zone from said first major face of the structure outside said grooves.

4,620,214

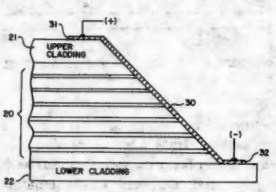
MULTIPLE QUANTUM-WELL INFRARED DETECTOR

Shlomo Margalit, Pasadena; Liew-Chuang Chiu, Milford; John S. Smith, Pasadena, and Amnon Yariv, San Marino, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Dec. 2, 1983, Ser. No. 557,594

Int. Cl.[4] H01L *29/167, 27/14*

U.S. Cl. 357—63 **2 Claims**



1. An infrared detector comprised of a heavily doped multiple quantum-well structure consisting of alternating layers of two semiconductor materials which form heterojunctions with a conduction-band discontinuity of desired magnitude for a quantum well in one material between layers of the second material, all of said layers being uniformly doped for the same type of single carrier conductivity, and means for biasing said quantum-well structure comprising a resistive voltage divider to bias each layer of said one material at a progressively higher voltage to neutralize any charge created by propagation of carriers in the avalanche photocurrent, thereby allowing an increase in the detector bias into the avalanche gain regime.

4,620,215

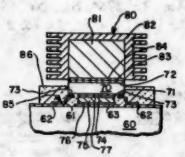
INTEGRATED CIRCUIT PACKAGING SYSTEMS WITH DOUBLE SURFACE HEAT DISSIPATION

James C. K. Lee, Los Altos Hills, Calif., assignor to Amdahl Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 368,957, Apr. 16, 1982, abandoned. This application Oct. 9, 1985, Ser. No. 786,229

Int. Cl.[4] H01L *23/36, 23/14, 23/54*

U.S. Cl. 357—81 **16 Claims**



1. A mounting arrangement for a semiconductor chip having a bottom surface and a top surface with an integrated circuit fashioned thereon, including a plurality of bonding pads disposed around the periphery of said top surface, comprising:

(a) a first heat sink having a mounting surface corresponding substantially to the area of said bottom surface of said chip;

(b) first means for mounting said mounting surface of said

first heat sink to said bottom surface of said chip in good heat transfer relation;

(c) a second heat sink having a mounting surface corresponding substantially to a region of said top surface of said chip interior to said bonding pads;

(d) second means for mounting said second heat sink to said top surface of said chip in good heat transfer relation wherein said top surface of said chip has a passivation layer of electrical insulating material deposited thereon and a layer of gold formed over a portion of said passivation layer interior to said bonding pads to provide a mounting pad for said second heat sink and wherein said second mounting means includes a solder preform formed of a low temperature alloy for bonding said second heat sink to said mounting pad.

4,620,216

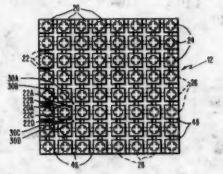
UNITARY SLOTTED HEAT SINK FOR SEMICONDUCTOR PACKAGES

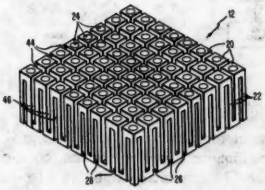
Joseph L. Horvath, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 489,875, Apr. 29, 1983, abandoned. This application Dec. 23, 1985, Ser. No. 812,498

Int. Cl.⁴ H01L *23/34, 23/46, 23/12*

U.S. Cl. 357—81 **8 Claims**





1. In a fluid cooled high density integrated circuit semiconductor device module having a substrate with a plurality of semiconductor devices operatively mounted thereon, a lid element mounted on the substrate forming an enclosure for the semiconductor devices, and I/O terminals on said substrate, the improvement comprising

a unitary heat sink formed of heat conductive material bonded to said lid element for dissipating heat generated by said semiconductor devices, said heatsink having a plurality of cooling fin elements arranged in columns and rows and positioned orthogonally relative to the top surface of said lid,

said fin elements having slots in the lower end that terminate short of the top of the fin element and which divides the lower end of each of the fin elements into a plurality of leg sections,

said heat sink having a plurality of flat quadralateral base portions individually bonded to said lid, said leg sections of an individual fin element being attached to different quadralateral base portions with adjacent fin elements supported by adjacent common base portions,

in operation said heatsink reducing stresses at the bonded interface of the heatsink and lid by flexure of said leg sections while providing effective large area heat transfer through the lid element to said fin elements.

4,620,217

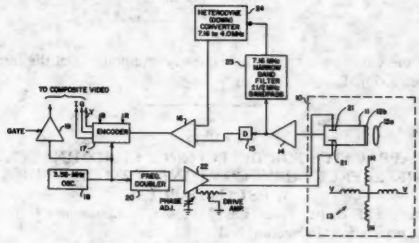
STANDARD TRANSMISSION AND RECORDING OF HIGH RESOLUTION TELEVISION

Jimmie D. Songer, Burleson, Tex., assignor to High Resolution Television, Inc., Los Angeles, Calif.

Filed Sep. 22, 1983, Ser. No. 534,592

Int. Cl.⁴ H04N *5/38, 9/04*

U.S. Cl. 358—12 **10 Claims**



1. In a television system having a bandwidth limited transmission channel comprised of a camera and a display unit, a method for improving vertical resolution of a video signal produced by said camera, frame by frame, comprising the steps of modulating the vertical beam deflection of said camera while producing said video signal for each line of a frame, said modulation having a frequency higher than the upper bandwidth limit of said transmission channel for causing each line scanned to undulate about the normal straight line scan, separating out of the video signal from said camera vertical modulated sidebands with pixel information which is narrow band; converting said sidebands with pixel information down to a frequency within said bandwidth limited channel using a converter; adding back to the video signal out of the camera the down-converted sidebands with pixel information before processing it further for transmission through the bandwidth limited channel; modulating the vertical beam deflection of said display unit with the same phase and relative amplitude as the modulation of the vertical beam deflection of said camera for display of each line of a frame in the same pattern as scanned by said camera, and at the display unit detecting the video signal transmitted; separating the down-converted sidebands with pixel information from the detected video signal, converting the separated sidebands with pixel information back up to said modulation frequency used at said camera; and adding the up-converted sidebands with pixel information back into the detected video signal before processing it further for display.

4,620,218

METHOD OF TRANSMITTING AND RECEIVING COLOR TELEVISION SIGNALS ON TWO CHANNELS FOR BROADCASTING FROM SATELLITE AND APPARATUS FOR CARRYING OUT SAID METHOD

Paolo D'Amato, and Rolando Salvadorini, both of Turin, Italy, assignors to Rai-Radio Televisione Italiana, Rome, Italy

Filed Jul. 1, 1983, Ser. No. 510,284

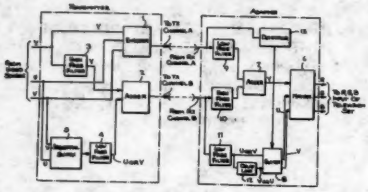
Claims priority, application Italy, Jul. 7, 1982, 22276 A/82

Int. Cl.⁴ H04N *9/36*

U.S. Cl. 358—12 **2 Claims**

1. A compatible method of transmitting color television signals on two channels for broadcasting from satellite, comprising the steps of transmitting on a first channel the complete color television signal and on a second channel the baseband

chrominance R-Y and B-Y signals at from 0 to about 3 MHz sequentially on alternate lines, and from 3 MHz up to the limit



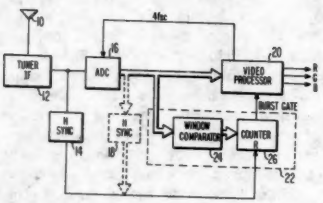
of the video band the high frequency components of the luminance signal.

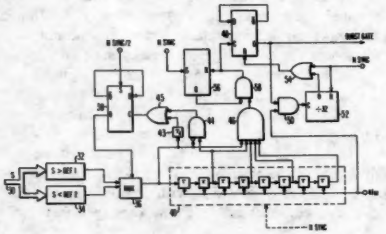
4,620,219

APPARATUS FOR DETECTING A CHROMINANCE REFERENCE BURST COMPONENT TO DEVELOP A BURST GATE PULSE

Sherwin D. D. Burrowes, East Windsor, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Aug. 6, 1984, Ser. No. 637,769
Int. Cl.[4] H04N 9/455
U.S. Cl. 358—20 **15 Claims**





1. Apparatus for generating a burst gate pulse from a composite video signal including a burst signal component and a horizontal synchronizing component, comprising:

a terminal for applying composite video signal;

signal detection means, coupled to said terminal, for generating a digital signal having a first state whenever the composite video signal occurs outside a predetermined range of values and a second state otherwise and wherein the mean value of the burst component resides within said predetermined range;

means coupled to said signal detection means and responsive to said digital signal for generating a control signal upon the occurrence of a predetermined number of occurrences of said digital signal being in said first state;

means, coupled to said control signal generating means, and responsive to said control signal for generating a pulse output signal corresponding to said burst gate pulse, said pulse output signal having a predetermined duration; and

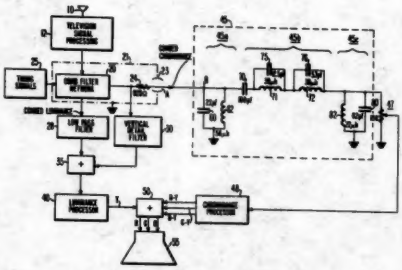
means coupled to said terminal and responsive to said horizontal synchronizing component for conditioning the combination of said control signal generating means and said pulse generating means to produce said pulse output signal for the first occurrence of said predetermined number of occurrences of said digital signal being in said first state after the occurrence of said horizontal synchronizing component.

4,620,220

WIDEBAND CHROMINANCE SIGNAL FILTER

Saiprasad V. Naimpally, and Wesley W. Murphy, III, both of Indianapolis, Ind., assignors to RCA Corporation, Princeton, N.J.

Filed Jun. 28, 1983, Ser. No. 508,593
Int. Cl.[4] H04N 9/64, 9/77
U.S. Cl. 358—40 **8 Claims**



2. In a system for processing a video signal including a wideband chrominance signal component comprising a chrominance subcarrier component exhibiting a frequency unsymmetrically disposed in the range of frequencies occupied by said chrominance signals, apparatus comprising:

a source of video signals exhibiting an amplitude characteristic with a decreasing slope over a frequency range including frequencies associated with said wideband chrominance component;

means for deriving said wideband chrominance component from said video signal, said derived chrominance component exhibiting said amplitude characteristic of decreasing slope; and

filter means responsive to said derived wideband chrominance signals and exhibiting a passband wherein said chrominance subcarrier frequency is unsymmetrically disposed in said passband, for providing output chrominance signals in accordance with the amplitude-versus-frequency response of said filter means; wherein

said filter means imparts to said chrominance signals an amplitude charcteristic with an increasing slope for substantially compensating for said amplitude characteristic with said decreasing slope; and

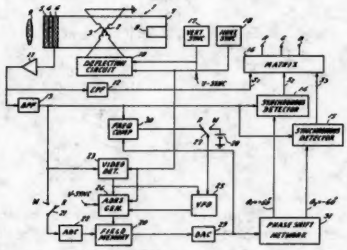
said filter means comprises plural mutually interactive resonant sections including an input resonant section; an output resonant section; and an intermediate resonant section coupling said input section to said output section.

4,620,221

COLOR IMAGING APPARATUS WITH COMPENSATION FOR BEAM DEFLECTION NONLINEARITY

Itsuo Takanashi, Yokohama; Shintaro Nakagaki, Fujisawa; Hiroshi Ichimura, Tokyo; Takashi Kuriyama, Tokyo, and Ichiro Negishi, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Feb. 21, 1984, Ser. No. 582,226
Claims priority, application Japan, Feb. 22, 1983, 58-28332
Int. Cl.[4] H04N 9/083, 9/07
U.S. Cl. 358—47 19 Claims



1. A color imaging apparatus wherein a color image is focused on a photoelectrical conversion target of a color image pickup tube through a color stripe filter and converted to an electrostatic image which is scanned in raster form by an electron beam under the control of a deflection system in response to horizontal and vertical sync pulses to generate a video signal from said photoelectrical conversion target, said color stripe filter comprising a plurality of recurrent groups of different color stripes successively arranged at periodic intervals so that said video signal has a frequency inversely proportional to the intervals at which said recurrent groups are arranged, said video signal varying in phase with the relative values of primary color components contained in the color image passing through the stripes of each group and in amplitude with the intensity of said primary color components, comprising:

a field memory;

reading and writing means for writing into the memory, during a write mode, a reference video signal derived from said target when the target is uniformly illuminated by light of a predetermined color passing through said color filter, wherein the frequency of the reference video signal varies as a function of inherent nonlinearity of the deflection system, and for repeatedly reading the reference video signal from the memory during a read mode to generate a reference frequency signal;

control means including a frequency comparator for detecting a frequency difference between said reference frequency signal and said video signal for controlling the frequency relationship between said reference frequency signal and said video signal in response to the detected frequency difference so that the frequency difference reduces towards zero; and

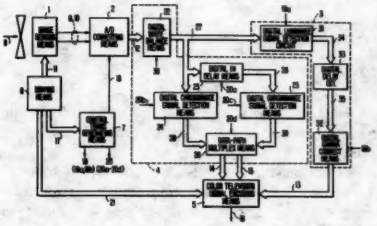
detector means for deriving a pair of color video components from the frequency-controlled video signal and reference frequency signal.

4,620,222

DIGITAL COLOR TV CAMERA

Takaaki Baba, Kounan, Japan, and Gerald T. O'Keefe, Cupertino, Calif., assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 8, 1983, Ser. No. 549,812
Claims priority, application Japan, Nov. 10, 1982, 57-196985; Nov. 12, 1982, 57-199190
Int. Cl.[4] H04N 9/077, 9/07
U.S. Cl. 358—48 18 Claims



1. A color camera comprising:

image sensing means for receiving optical signals to produce two alternately different pixel signals—a first pixel signal and a second pixel signal, the first pixel signal being composed of two different α and β color pixel signals which are shifted out at a repetition frequency of f_c in one of two consecutive horizontal synchronous intervals of a television signal, and the second pixel signal being composed of two different γ and δ color pixel signals which are different from the α and β color pixel signals in the first pixel signal and which are shifted out at a repetition frequency of f_c in the other of said two consecutive horizontal synchronous intervals of the television signal;

analog to digital (A/D) converting means for receiving said two alternately different pixel signals to produce a multiplexed digital pixel signal;

digital chrominance signal processing means for receiving said multiplexed digital pixel signal to produce two independent digital chrominance difference signals;

digital luminance signal processing means for receiving said multiplexed digital pixel signal to produce a digital luminance signal;

color television signal encoding means for receiving said two independent digital chrominance difference signals and said digital luminance signal to produce a color television signal;

control circuit means for generating first, second and third sets of timing pulses which are for respectively controlling said A/D converting means, said digital chrominance signal processing means and said digital luminance signal processing means; and

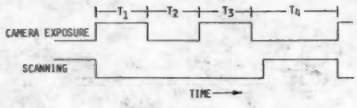
driving means for driving said image sensing means, said color television signal encoding means and said control circuit means, wherein said digital chrominance signal processing means comprises: digital one horizontal synchronous period (1H) delay means; first digital chrominance signal detection means; second digital chrominance signal detection means; and data-path multiplex means, said multiplexed digital pixel signal being applied to said first digital chrominance signal detection means and said digital 1H delay means, output signals from said digital 1H delay means being applied to said second digital chrominance signal detection means, and output signals from said first and second digital chrominance signal detection means being applied to said data-path multiplex means.

4,620,223

INTERFEROMETRIC DEFORMATION ANALYSIS SYSTEM

Richard E. Haskell, and Yau Y. Hung, both of Rochester, Mich., assignors to Industrial Holographics, Inc., Auburn Heights, Mich.

Continuation of Ser. No. 414,519, Sep. 3, 1982. This application Sep. 21, 1984, Ser. No. 652,979
Int. Cl.[4] H04N 7/18
U.S. Cl. 358—107 15 Claims



1. A method of analyzing the deformation of an object resulting from the application of a stress thereon comprising the steps of:

(a) illuminating the object with a source of coherent light;

(b) receiving light reflected from said object and resolving said reflected light into first and second overlapping images of said object;

(c) converging said first and second overlapping images into interfering relationship with each other to produce a first interferogram;

(d) exposing the signal plate of a television camera to said first interferogram;

(e) stressing said object;

(f) producing a second interferogram using light reflected from the object when the latter is stressed;

(g) exposing the signal plate of the camera to said second interferogram; and

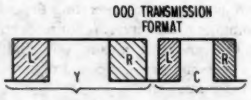
(h) scanning said signal plate after steps (a) through (g) are performed to produce video signals corresponding to a superimposed, composite image of the object having fringe families arrayed as a function of the deformation of the object produced by said stressing.

4,620,224

VIDEO SCRAMBLING TECHNIQUE FOR MULTIPLEXED ANALOG COMPONENT FORMATS

Lin-nan Lee, Potomac, and Mark D. Redman, Clarksburg, both of Md., assignors to Communications Satellite Corp., Washington, D.C.

Filed Apr. 3, 1985, Ser. No. 719,200
Int. Cl.[4] H04K 1/00; H04N 7/16, 7/167
U.S. Cl. 358—119 8 Claims



1. A method for scrambling a television signal comprising the steps of:

formatting a television signal into a data portion and a video portion wherein said video portion has chrominance information and luminance information which portions are scanned for each horizontal line of a television picture;

writing said luminance portion and chrominance portion into luminance and chrominance memories, respectively;

encoding said data portion to represent the directions in which the chrominance information and luminance information are to be read; and

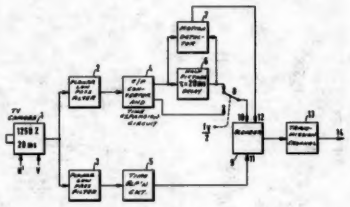
encoding said data portion to represent the position of the chrominance information relative to the luminance information in the video portion.

4,620,225

SYSTEM FOR TV TRANSMISSION

Broder Wendland, Waltrop, and Dirk Uhlenkamp, Dortmund-Somborn, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Sep. 7, 1983, Ser. No. 530,073
Claims priority, application Fed. Rep. of Germany, Sep. 13, 1982, 3233882
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—141 8 Claims



1. A system for TV transmission of pictures assembled of a first number of scanning lines, comprising pick-up means for scanning optical scenes to be transmitted, said pickup means generating a scanned signal corresponding to a series of half pictures each assembled of a second number of scanning lines that is four times higher than said first number and being scanned without scanning line jumps in a half picture;

means for branching said scanned signal into two signal processing units;

one of said signal processing units including serial/parallel converting means for retrieving from said signal every other line and time expanding the retrieved lines by a factor of four to produce first and second parallel signals corresponding to first and second half pictures each assembled of said first number of scanning lines;

the other of said signal processing units including means for retrieving from said signal each forth line and suppressing the intermediate lines and time expanding the retrieved lines of said other signal processing unit by a factor of four to produce a third signal corresponding to said first half picture assembled of said first number of scanning lines;

motion detecting means for producing a control signal when a motion component is detected in said first parallel signal;

means for delaying said first parallel signal for a scanning period of one half picture;

a blending unit controlled by said control signal to mix alternately the delayed first parallel signal from said delaying means and the non-delayed second parallel signal from said time expanding means in said one signal processing unit with the third signal from said other signal processing unit to produce an output signal corresponding to a series of first and second half pictures assembled of said first number of scanning lines and having an increased motion resolution.

4,620,226

APPARATUS FOR PRODUCING AUDIO AND VISUAL SIGNALS FOR MODULATING A TELEVISION SYSTEM CARRIER SIGNAL

William S. H. Cheung, 95B Robinson, Hong Kong, Hong Kong

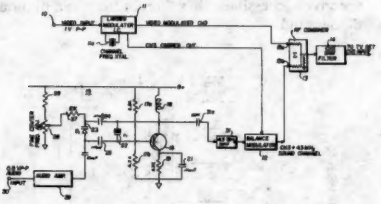
Filed May 17, 1984, Ser. No. 611,249
Int. Cl.[4] H04N 7/04
U.S. Cl. 358—143 4 Claims

1. In a television system, an audio frequency subcarrier generator comprising:

a transistor oscillator including as one frequency determining element a ceramic resonator;

a voltage sensitive reactance coupled to said ceramic resonator for shifting the frequency response of said ceramic resonator;

bias means for applying a DC voltage to said voltage sensitive reactance whereby a center frequency of operation for said transistor oscillator is obtained;



means for applying an audio modulating signal to said voltage sensitive reactance whereby said oscillator frequency varies with respect to said center frequency;

a balanced modulator for receiving on one input an unmodulated video carrier signal, and on a remaining input an audio modulated subcarrier from said transistor oscillator; and

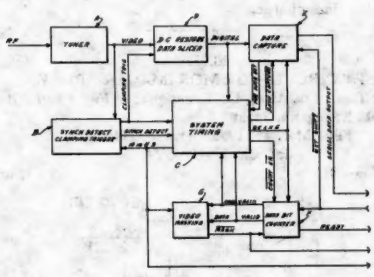
an RF signal combiner circuit for receiving on one input a signal from said balanced modulator, and on another input a modulated video signal carrier.

4,620,227

DATA DECODER

Michael M. Levin, Agoura Hills, and Jerry A. Boshear, Simi Valley, both of Calif., assignors to Cybernetic Data Products, Chatsworth, Calif.

Filed Jan. 30, 1984, Ser. No. 575,030
Int. Cl.[4] H04N *7/093, 7/08*
U.S. Cl. 358—147 **37 Claims**



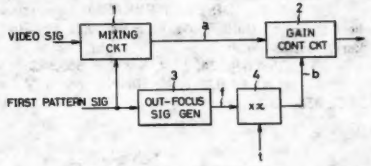
1. A decoder for decoding data from a video signal of the type including a series of horizontal line segments, one of the lined segments including a data signal in a normally unused part thereof, said apparatus comprising means for digitizing said video signal to form a series of digitized line signals, means for receiving each of said digitized line signals, in sequence, said receiving means comprising shift register means having an input operably connected to receive said digitized line signals, means for clocking said shift register means, means for detecting the presence of a data signal within said receiving means, means for controlling said receiving means to store the data signal in response to the detection thereof, and means for transferring said stored data signal from said receiving means.

4,620,228

TELEVISION SIGNAL GENERATOR

Tsuneo Mikado, Tokyo, Japan, assignor to Nippon Television Industry Corporation, Tokyo, Japan

Filed Jun. 19, 1984, Ser. No. 622,134
Claims priority, application Japan, Jun. 23, 1983, 58-113476
Int. Cl.[4] H04N *5/14*
U.S. Cl. 358—160 **5 Claims**



1. A television signal generator comprising:

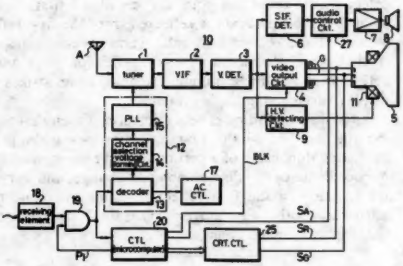
a pattern signal generator receiving a first pattern signal representing a predetermined region on a screen and producing a second pattern signal which causes an area of the predetermined region to increase and then decrease to an original value over time; and a gain control circuit receiving said second pattern signal for controlling as a function of said second pattern signal a luminance level of a video signal including the first pattern signal.

4,620,229

PICTURE DISPLAY DEVICE

Toshio Amano, Kanagawa; Yoshihisa Fujioka, Saitama; Kunio Nagai, Kanagawa, and Osamu Oda, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Apr. 24, 1985, Ser. No. 726,680
Claims priority, application Japan, Apr. 28, 1984, 59-87637
Int. Cl.[4] H04N *5/44*
U.S. Cl. 358—194.1 **12 Claims**



1. A picture display apparatus for displaying at least first, second and third types of pictures in that order in a repeating cyclical sequence, said picture display apparatus comprising;

display means having first, second and third modes of operation for displaying said first, second and third types of pictures, respectively;

actuable switch means;

control means operably connected to said display means and responsive to actuation of said switch means for establishing one of said modes of operation and thereby selecting the respective one of said types of pictures for display, each of said modes having a characteristic event occurring therein;

timing means for determining an elapsed time from said characteristic event occurring in the respective mode to a next actuation of said switch means;

said control means being responsive to an actuation of said switch means in each of said modes to select the next of said modes in said sequence when said elapsed time is less than a predetermined time, and to select said first mode for displaying said first type of picture when the elapsed time is at least as great as said predetermined time.

4,620,230

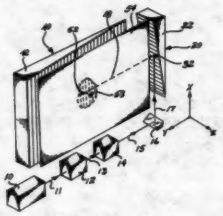
DISPLAY SYSTEM

Robert J. Spiger, Bothell, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Sep. 24, 1984, Ser. No. 653,582

Int. Cl.[4] G02F *1/33*; H04N *5/66, 5/74*

U.S. Cl. 358—201 **14 Claims**



1. A display system comprising:

a display panel including a display surface extending along X and Y axes;

a plurality of first mirrors located at different positions along the X axis, each first mirror having an elongated dimension oriented normal to the X axis;

a plurality of second mirrors located at different positions along the Y axis, each second mirror having an elongated dimension oriented normal to the Y axis;

a source of light;

means for modulating the intensity of the light;

deflection means for directing the light as a first beam to a selected first reflection point on one of the first mirrors such that the first beam is reflected from the first reflection point as a second beam, the second beam strikes one of the second mirrors at a second reflection point and is reflected as a third beam, and the third beam strikes the display surface at a display point;

the first and second mirrors being positioned such that varying the location of the first reflection point along the elongated dimension of a particular first mirror causes the Y coordinate of the display point to change, and varying the location of the first reflection point from one first mirror to another first mirror causes the X coordinate of the display point to change.

4,620,231

CCD IMAGER WITH PHOTODETECTOR BIAS INTRODUCED VIA THE CCD REGISTER

Walter F. Kosonocky, Somerset County, N.J., assignor to RCA Corporation, Princeton, N.J.

Filed Jun. 18, 1984, Ser. No. 621,381

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **4 Claims**

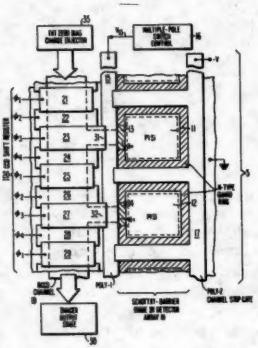
1. In a semiconductor imager including a linear array of photodetector diodes arranged to provide photoconversion to charge of radiation impinging thereon;

a CCD shift register having a charge transfer channel between an input end thereof and an output end thereof, which charge transfer channel parallels said linear array of photodetector diodes and has respective offshoots facilitating connection with those photodetector diodes;

an imager output stage for generating imager output signal responsive to charge packets supplied thereto from the output end of said CCD shift register;

means for transferring at selected times, separated by image integration intervals, charge packets from said photodetector diodes to said charge transfer channel via its respective offshoots to them;

means for forward clocking said CCD register during said image integration intervals to successively transfer to said imager output stage charge packets transferred into respective successive stages thereof from said photodetector diodes; and



means for improving the charge transfer efficiency of charge transfer from said photodetector diodes to said charge transfer channel, comprising:

means for transferring respective bias charge packets into said photodetector diodes to augment charge accumulated from photoconversion, said transferring respective bias charge packets into said photodetector diodes being done prior to each said selected time of transferring charge packets from said photodetectors, thereby to cause at those selected times transferring of charge packets from said photodetector diodes each of which packets comprises charge accumulated from photoconversion superposed on bias charge.

4,620,232

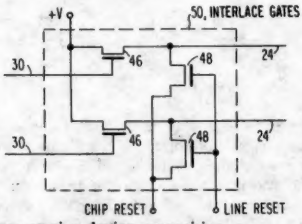
RESET CIRCUIT FOR MOS IMAGER ARRAY

J. Gilbert Tisue, Los Altos, Calif., assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Mar. 15, 1985, Ser. No. 711,941

Int. Cl.[4] H04N *3/14*

U.S. Cl. 358—213 **9 Claims**



1. An image-sensing device, comprising:

a photosensing array comprising a plurality of photosensing elements arranged in intersecting rows and columns, photosensing elements arranged along a row being simultaneously activated for reading, a signal from any photosensing element activated along a column being read as a signal for that column; and

means for sequentially resetting said columns of photosens-

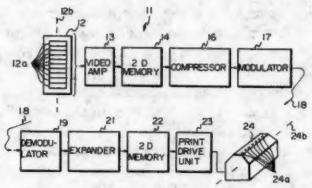
ing elements wherein all photosensing elements within each column are reset in a simultaneous operation.

4,620,233

FACSIMILE TRANSCEIVER UTILIZING ORTHOGONAL CONVERSION

Mutsuo Ogawa; Takemi Hashimoto; Kazuyuki Hara, and Mitsuru Kondo, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 967,834, Dec. 8, 1978, abandoned. This application Dec. 29, 1982, Ser. No. 454,307
Claims priority, application Japan, Dec. 19, 1977, 52-151731
Int. Cl.[4] H04N *7/40*
U.S. Cl. 358—260 16 Claims



1. A facsimile transceiver apparatus including a scanning array of photosensor elements extending in a first direction, scan drive means for moving the scanning array in a second direction which is different from the first direction for scanning an original document, the photosensor elements producing data signals corresponding to incident light from the document, transmission means for transmitting the data signals; receiving means for receiving data signals, a printing array of printing elements extending in a third direction and print drive means for moving the printing array in a fourth direction which has a same relationship to the third direction as the second direction has to the first direction for printing a pattern on a printing surface corresponding to the received data signals, characterized by comprising;

orthogonal conversion memory means for performing orthogonal conversion on data signals fed from the scanning array to the transmission means and for performing reverse orthogonal conversion on data signals fed from the receiving means to the printing array; and

data compression means connected between the memory means and the transmission means for compressing data signals and expansion means connected between the receiving means and the memory means for expanding data signals;

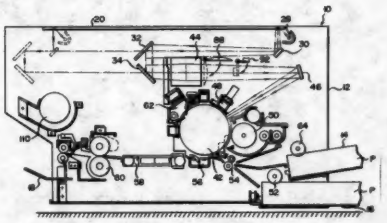
the memory means comprising a plurality of orthogonal memories which are constructed to sequentially store a plurality of lines of data signals, the scan drive means comprising means for detecting when at least one of the orthogonal memories is available to store data signals and move the scanning array for scanning in response thereto, the scan drive means holding the scanning array in an initial position thereof in response to none of the orthogonal memories being available to store data signals, the compression means reading data signals out of the orthogonal memories sequentially in accordance with a variable compression rate thereof regardless of whether or not the scanning array is moving.

4,620,234

ELECTRONIC VISUAL IMAGE FORMING APPARATUS

Junji Watanabe, Yokohama, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 6, 1984, Ser. No. 637,808
Claims priority, application Japan, Aug. 12, 1983, 58-146581
Int. Cl.[4] H04N *1/04, 1/10*
U.S. Cl. 358—285 5 Claims



1. An image forming apparatus comprising:

a housing;

rest means provided on the housing, for resting a document thereon;

exposure means provided under the rest means, for exposing the document rested on the rest means;

drive means for causing a relative movement between the rest means and the exposure means to optically scan the document;

an image carrier provided in the housing and carrying a latent image thereon corresponding to the image impression of the document;

optical means for guiding the light reflected from the document to the image carrier through an optical path to form the latent image on the image carrier;

reading means provided in the optical path, for reading out the image impression of the document and generating signals representing the image impression, said reading means being retractable from the optical path, the reading means being set in the optical path when the exposure means advances, said reading means being retracted from the optical path when the exposure means returns; and

display means provided on the housing, for displaying the image impression of the document, based on the signals from the reading means.

4,620,235

DISC FILM SCANNING APPARATUS

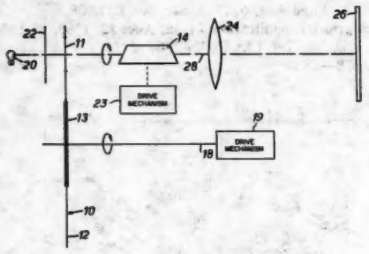
Peter B. Watt, Welwyn Garden, England, assignor to Eastman Kodak Company, Rochester, N.Y.

PCT No. PCT/GB84/00223, § 371 Date Sep. 19, 1984, § 102(e) Date Sep. 19, 1984, PCT Pub. No. WO85/00490, PCT Pub. Date Jan. 31, 1985
PCT Filed Jun. 25, 1984, Ser. No. 653,266
Claims priority, application United Kingdom, Jul. 6, 1983, 8318278
Int. Cl.[4] H04N *1/04*
U.S. Cl. 358—293 8 Claims

1. A method of effecting line by line scanning of a rectangular image area of a plurality of such areas located annularly on a rotatable disc film, the method comprising the steps of:

(a) indexing the disc about its axis to present the first of such areas at a scanning station,

(b) forming an image of a line of the rectangular image area on a linear CCD array in the scanning station, and



(c) moving the image so formed in a direction perpendicular to the linear CCD array to present images of successive lines of the rectangular image area on the CCD array.

4,620,236

IMAGE PICTURE READING DEVICE

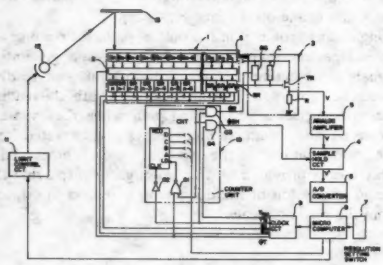
Seiichi Tanaka, Osaka, and Fumikazu Nagano, Yamatokoriyama, both of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 8, 1985, Ser. No. 796,156

Claims priority, application Japan, Nov. 9, 1984, 59-237115

Int. Cl.⁴ H04N *1/02*

U.S. Cl. 358—293 **1 Claim**



1. An image picture reading device having a light source to irradiate an original copy, a series of sensors arranged in a line for detecting densities of small areas of said original copy by light reflected from the original copy, a reading circuit for sequentially outputting signals for the densities detected by said sensors for the small area of the original copy, and a buffer for storing and outputting the density signals sequentially received from said reading circuit, said buffer being reset for an initial state at constant intervals, said image picture reading device, comprising:

setting means for inputting a resolution "K" value for said reading device;

buffer control means for setting a reset pulse cycle for said buffer at a period for which picture density signals are accumulated to the quantity of "k" corresponding to the "k" value input by said setting means;

a light source control circuit for controlling the light amount of said light source; and

control means for setting the light source control circuit so as to control the light amount to 1/k according to the "k" value set by said setting means.

4,620,237

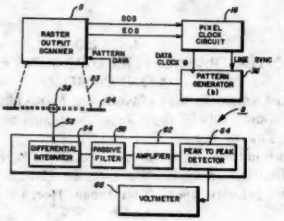
FAST SCAN JITTER MEASURING SYSTEM FOR RASTER SCANNERS

James C. Traino, Fairport, and Douglas L. Keene, Central Valley, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1984, Ser. No. 663,634

Int. Cl.⁴ H04N *1/23, 1/36, 1/29;* G02B *26/08*

U.S. Cl. 358—300 **10 Claims**



1. In a system for detecting and measuring fast scan jitter as the scanning beam of a raster output scanner scans across a recording member, said scanner including means for modulating said beam in accordance with a signal input, comprising in combination:

(a) beam detecting means, said beam detecting means including first and second photosensors in the path of said scanning beam, said first and second photosensors each being adapted to produce a signal pulse as said scanning beam scans thereacross, said signal pulses being substantially equal in the absence of fast scan jitter;

(b) means for integrating said signal pulses to provide a test signal proportional to the difference between said signal pulses on each sweep of said beam; and

(c) peak detecting means for comparing the peak to peak variation between said test signals to provide a jitter signal.

4,620,238

METHOD AND APPARATUS FOR RECORDING AND REPLAY OF DIGITAL AUDIO DATA

Philip S. Gaskell, London, England; Roger Lagadec, Rumlang, Switzerland, and Guy W. W. McNally, Shere, England, assignors to Willi Studer AG, Regensdorf, Switzerland

Filed Aug. 24, 1984, Ser. No. 644,194

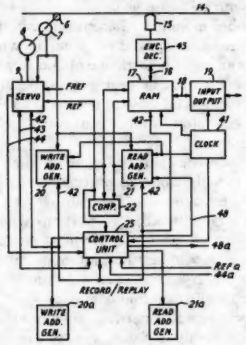
Claims priority, application United Kingdom, Aug. 26, 1983, 8323110

Int. Cl.⁴ G11B *5/00, 15/46*

U.S. Cl. 360—8 **20 Claims**

1. A method of effecting fast start-up of a recording or replay operation of digital information on a magnetic tape having a nominal tape speed range, characterised in that recording and play-back are effected through a digital store the tape is accelerated rapidly so as to appreciably overshoot the

nominal tape speed range before stabilizing in that range, and recording on to the tape from the digital store or replay from



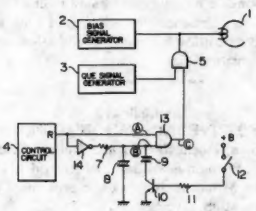
the tape into the digital store is initiated substantially before the speed has stabilized in the said range.

4,620,239

RETRIEVAL SIGNAL RECORDING APPARATUS FOR MAGNETIC TAPE RECORDING/REPRODUCING APPARATUS

Fumiaki Fujii, Katsuta, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 14, 1984, Ser. No. 589,645
Claims priority, application Japan, Mar. 18, 1983, 58-44118
Int. Cl.[4] G11B 5/00, 5/02
U.S. Cl. 360—8 18 Claims



1. A retrieval signal recording apparatus for magnetic tape recording/reproducing apparatus capable of switching a plurality of different tape speeds, comprising:

means for generating a retrieval signal and recording it on a magnetic tape; and

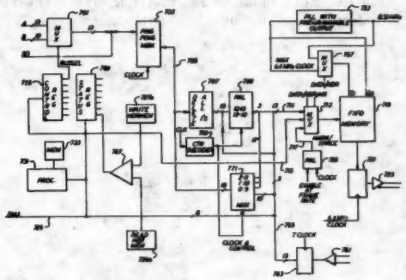
means for controlling said recording means at least at the beginning of recording an information signal on said magnetic tape to change to recording time of said retrieval signal in response to the switching of the tape speeds so that the length of the retrieval signal recorded on the magnetic tape is substantially constant even if a different tape speed is selected, said means for controlling recording means including gate means for allowing said retrieval signal to pass therethrough, and means for generating a gate control signal the duration of which is changed in association with the tape speed switching means of the magnetic tape recording/reproducing apparatus and which is used to open said gate means, in response to a signal for making the magnetic tape recording/reproducing apparatus in the mode of recording the information signal.

4,620,240

WIDE BAND TAPE RECORDER INTERFACE FOR RECORDING DIGITAL IMAGE DATA IN REAL TIME

Clifton J. McCarthy, Pinehurst, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Jan. 4, 1984, Ser. No. 568,024
Int. Cl.[4] G11B 5/09
U.S. Cl. 360—48 10 Claims



1. Apparatus for interfacing a wide-band tape recorder having M channels in parallel with a digital image processing system, processing frames of digital information made up of arrays of pixels, each pixel represented by an N bit digital word with the digital words representative of the pixels available on an N bit parallel bus in which each line of the array is presented in serial order from top to the bottom of the frame comprising:

(a) a memory for storing desired header information which is to be provided with each frame of information;

(b) means to buffer incoming N bit words from the bus;

(c) means for converting said N bit words into M bit words, said means for converting having said N bit words from said means to buffer as inputs and providing an M bit parallel output; and

(d) output means having as inputs the M bit parallel output of said means for converting, and having an M bit parallel output coupled as the input to said wide-band tape recorder, said output means adapted to insert the header information contained in said memory at the beginning of each frame of information which is transferred to said tape recorder.

4,620,241

TAPE SPEED CONTROL SYSTEM FOR MAGNETIC TAPE RECORDER

Tsuyoshi Ono, Yamato, Japan, assignor to Victor Company of Japan, Limited, Yokohama, Japan

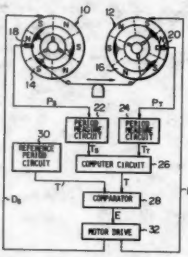
Filed Jul. 5, 1983, Ser. No. 511,112
Claims priority, application Japan, Jul. 7, 1982, 57-118287
Int. Cl.[4] G11B 15/46
U.S. Cl. 360—73 4 Claims

1. A system for controlling the running speed of a magnetic tape in a fast feed mode operation of a magnetic tape recorder which includes a take-up reel and a supply reel each being driven for rotation by drive means, said system comprising:

rotation period detector means for detecting a rotation period of the take-up reel and a rotation period of the supply reel and producing outputs indicative of the detected rotation periods;

computing means for weighting one of the detected rotation periods and producing a sum of the weighted rotation period and the other which is the non-weighted rotation period, in which assuming that a weighting constant is n, n=1.5, said computing means comprising two input terminals receiving the outputs of said rotation period detection means, one of said input terminals being connected via a

first resistor means to a first analog switch means, the other of said input terminals being connected via a second resistor to a second analog switch means, a third resistor connected between the junction of said one input terminal and said first resistor means and the junction of said second resistor and said second analog switch means, a fourth resistor connected between the junction of said other input terminal and said second resistor and the junction of said first resistor means and said first analog switch means, a comparator having a noninverting input connected to said one inut terminal and an inverting input connected to said other input terminal, said comparator having an out-



put connected to said first analog switch means and via an inverter to said second analog switch means;

reference period predetermining means for predetermining a reference rotation period and producing a reference period output; and

comparing means for comparing the sum period produced by the computing means with the reference period output from the reference period predetermined means and generating a difference signal, said difference signal being fed to the drive means;

whereby the magnetic tape is moved at a selected speed regardless of the tape roll radius built up on the take-up reel.

4,620,242

APPARATUS FOR CONTROLLING A REVERSIBLE TAPE DRIVE IN A MAGNETIC TAPE PLAYER

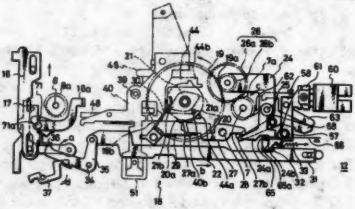
Kozoh Takahashi, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 16, 1985, Ser. No. 788,113

Claims priority, application Japan, Oct. 20, 1984, 59-220720

Int. Cl.[4] G11B *5/56, 15/44*

U.S. Cl. 360—74.1 **16 Claims**



1. In a magnetic tape player having a tape drive device selectively operative to drive a tape in normal and reverse directions in a forward mode of the tape player, apparatus for controlling said tape drive device comprising:

a rotatable cam gear having a toothed periphery with a pair of diametrically opposed gaps therein;

a rotatable driving gear engageable with said toothed periphery of the cam gear for turning the latter through approximately 180° upon each engagement of said driving gear with said toothed periphery;

a pair of diametrically opposed stopper projections rotatably coupled with said cam gear;

a latch member mounted adjacent said cam gear and movable between an engaged position, in which said latch member is engageable with one of said stopper projections for positioning said cam gear in a rest position with one of said gaps facing said driving gear, and a released position in which said latch member is disengaged from said stopper projections;

a cam surface on said cam gear having a pair of diametrically opposed, radially enlarged portions;

spring means engaging said cam surface and acting against one of said radially enlarged portions when a respective one of said gaps faces said driving gear for turning said cam gear from said rest position upon movement of said latch member to said released position;

an eccentric member on said cam gear;

a change lever movable between first and second positions for causing operation of said tape drive to drive the tape in said normal and reverse directions, respectively;

a cam follower member engageable with said eccentric member and being pivotally mounted on said change lever;

a spring-loaded lock arm also pivotally mounted on said change lever and being movable between a normal operative position for locking said cam follower member relative to said change lever and an inoperative position in which said cam follower member is free to pivot relative to said change lever;

a forward mode selecting member having an inactive position, in which said lock arm is displaced to said inoperative position thereof, and being movable to an active position for selecting said forward mode and releasing said lock arm to permit the latter to attain said normal operative position; and

means responsive to pivoting of said cam follower member by said eccentric member when said lock arm is in said inoperative position for moving said latch member to said released position.

4,620,243

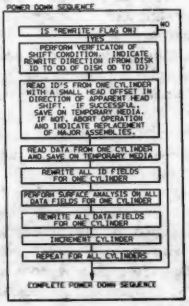
DISK DRIVE INCREMENTAL REWRITE

Kirby L. Bakken, Rochester, Minn.; Robert G. Judson, Santa Clara, Calif.; William E. Miller, and Ronald A. Peterson, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 29, 1985, Ser. No. 770,455

Int. Cl.[4] G11B *21/10, 5/09*

U.S. Cl. 360—77 **17 Claims**


POWER DOWN SEQUENCE
IS "REWRITE" FLAG ON?
NO
YES
PERFORM VERIFICATION OF SHIFT CONDITION, INDICATE REWRITE DIRECTION (FROM DISK ID TO ID OF DISK OR TO ID)
READ ID'S FROM ONE CYLINDER WITH A SMALL HEAD OFFSET IN DIRECTION OF APPARENT HEAD SHIFT. IF SUCCESSFUL, SAVE ON TEMPORARY MEDIA. IF NOT, ABORT OPERATION AND INDICATE REPLACEMENT OF MAJOR ASSEMBLIES.
READ DATA FROM ONE CYLINDER AND SAVE ON TEMPORARY MEDIA
REWRITE ALL ID FIELDS FOR ONE CYLINDER
PERFORM SURFACE ANALYSIS ON ALL DATA FIELDS FOR ONE CYLINDER
REWRITE ALL DATA FIELDS FOR ONE CYLINDER
INCREMENT CYLINDER
REPEAT FOR ALL CYLINDERS
COMPLETE POWER DOWN SEQUENCE

1. A system for detecting degraded readability of information stored in tracks on a disk surface of a multiple disk surface

disk drive and rewriting selected portions of the information, the system comprising:

a transducer means for reading and recording information on the disk, the transducer means being moveable from track to track as a function of servo information on a different disk surface and being moveable over portions of each track;

detection means coupled to the transducer means for detecting degraded readability of the information as the transducer means is moved about an expected center of a selected track as indicated by the servo information; and

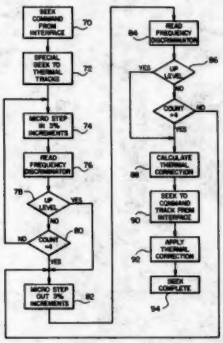
control means for storing selected increments of information from the transducer means and providing such information to the transducer means for recording onto the selected track at its expected center as a function of the readability of the information.

4,620,244

COMPENSATION METHOD TO CORRECT THERMALLY INDUCED OFF-TRACK ERRORS IN DISC DRIVES

James N. Krause, Santa Clara County, Calif., assignor to Seagate Technology, Scotts Valley, Calif.

Filed Nov. 20, 1985, Ser. No. 800,061
Int. Cl.[4] G11B *5/55*
U.S. Cl. 360—77 **15 Claims**



1. A method for correction of thermal mistracking in a disc drive comprising a rotating disc characterized by a plurality of spaced circular tracks for storing recorded data, actuator means for accessing the data comprising a carriage, means for mounting a transducer at one end of the carriage, means adjacent the periphery of the rotating disc for driving and positioning the carriage along a known path to position the transducer relative to the disc and the tracks, the method comprising the steps of

defining a selected thermal test track on said disc at a location on said disc not accessible to the user,

recording a reference signal along a track on at least one side of said test track,

moving said transducer with no thermal correction applied to said thermal test track,

moving said transducer in known incremental movements from said thermal test track toward said reference signal to detect said reference signal,

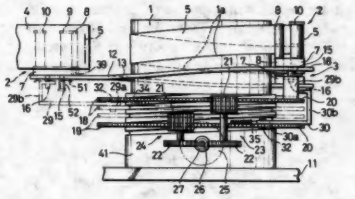
operating on said information derived from said incremental movements to determine thermal shift of said transducer relative to said tracks on said disc and applying the knowledge of said determined thermal shift to subsequent seeks to user-accessible data tracks.

4,620,245

TAPE LOADING APPARATUS FOR USE IN A RECORDING AND/OR REPRODUCING APPARATUS OF THE ROTATING HEAD KIND

Osamu Shimizu, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed May 2, 1984, Ser. No. 606,151
Claims priority, application Japan, May 16, 1983, 58-85596
Int. Cl.[4] G11B *15/66*
U.S. Cl. 360—85 **4 Claims**



1. A tape loading apparatus mounted on a chassis for extracting a tape from a tape cassette and winding the tape around a rotary head drum comprising:

a pair of tape guide blocks for extracting said tape from said tape cassette and winding said tape around said rotary head drum;

a pair of guide rails for guiding said pair of tape guide blocks along both sides of said rotary head drum, at least one of said guide rails being inclined with respect to a plane perpendicular to the axis of said rotary head drum in order that said pair of tape guide blocks have a level difference at the tape-loaded positions thereof with respect to the axial direction of said rotary head drum;

a pair of upper and lower ring gears rotatably arranged around said rotary head drum for moving said pair of tape guide blocks along said pair of guide rails with the rotations of said ring gears;

a pair of connecting means for connecting said pair of tape guide blocks to said pair of ring gears;

a drive means for rotating said pair of ring gears in the opposite directions to each other; and

means for moving at least one of said ring gears along the axis of said rotary head drum and maintaining said upper and lower ring gears in mutual parallel relationship, said means for moving being adapted for rotatably supporting said pair of upper and lower ring gears, so that the level relationships between said tape guide blocks and said ring gears are substantially kept constant while said pair of ring gears rotate in the opposite directions to each other.

4,620,246

CASSETTE EJECTION MECHANISM OF A CASSETTE TAPE RECORDER

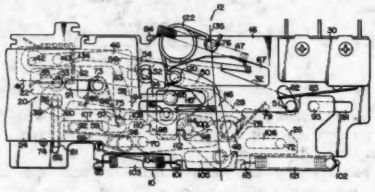
Toshikazu Kato, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Jul. 30, 1982, Ser. No. 403,865
Claims priority, application Japan, Aug. 12, 1981, 56-126362
Int. Cl.[4] G11B *15/00*
U.S. Cl. 360—96.5 **5 Claims**

1. A cassette ejection mechanism of a cassette tape recorder comprising a pair of guide plates facing each other, a cassette holder including a holder support rockingly attached to the guide plates and a holder body supported by the holder support, said cassette holder and holder body being movable between upper and lower positions between the guide plates and capable of housing a tape cassette therein, and a magnetic head and a pinch roller arranged movably to come into contact with a magnetic tape in a tape cassette in the cassette holder when the cassette holder is located in the lower position

thereof, wherein a tape cassette located together with the cassette holder in the lower position of the cassette holder, along with the cassette holder, moves to the upper position of the cassette holder after the magnetic head and the pinch roller move to positions where the magnetic head and the pinch roller do not hinder the movement of the cassette holder, and then a tape cassette slides in the cassette holder to be ejected, and further comprising:

an ejecting plate attached to one of the guide plates to be movable between first and second positions, whereby the magnetic head and the pinch roller are moved to the positions where the magnetic head and the pinch roller do not hinder the movement of the cassette holder as the ejecting plate moves from the first position to the second position thereof, and whereby a tape cassette in the cassette holder is slid to be ejected as the ejecting plate moves from the second position to the first position;



a boosting plate attached to said one guide plate to be movable between first and second positions, whereby the cassette holder is moved from the lower position to the upper position thereof as the boosting plate moves from the first position to the second position thereof;

urging means stretched between the ejecting plate and the boosting plate, whereby the boosting plate is urged to move from the first position to the second position thereof as the ejecting plate moves from the first position to the second position thereof; and

a stop member attached to said one guide plate for engaging the boosting plate, thereby locking the boosting plate in the first position thereof,

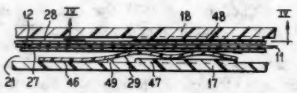
said ejecting plate including pressing means for pressing the stop member to disengage the stop member from the boosting plate when the ejecting plate reaches the second position thereof.

4,620,247

DISKETTE SPRING AND DISKETTE

Walter A. Papciak, Elmwood Park; Karl K. Hoffman, Arlington Heights; Roger Engel, Schaumburg, and Adam Wieczorek, Chicago, all of Ill., assignors to Plicon Corporation, Elk Grove Village, Ill.

Filed Jun. 4, 1985, Ser. No. 741,171
Int. Cl.[4] G11B *5/012*; F16F *1/18*
U.S. Cl. 360—97 **22 Claims**



1. A spring structure for a micro floppy diskette or the like comprising:

(A) an elongated piece of plastic sheeting having opposed, parallel faces and a front end and an opposite back end,

(B) said plastic sheeting being comprised of a resilient, flexible, relatively rigid, preformed, temperature stable, uniform organic polymeric material,

(C) said piece including two regions,

(D) one said region being generally flat and located adjacent said back end,

(E) the other said region having at least one generally transversely extending wave formed therein, said wave being upstanding relative to said one region and having a generally uniform crest region with a trough region being defined on each side of each such wave, each trough region being generally coplanar with said one region, and said front end being generally coplanar with said one region, and

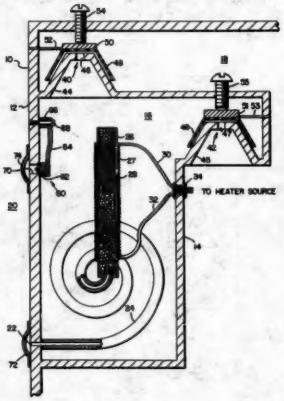
(F) at least a portion of one said face in said one region bearing a layer of an adhesive, said one face being opposed to the other said face wherein the outer surface of each crest regions is defined.

4,620,248

APPARATUS FOR CONTROLLING HUMIDITY IN A DISK DRIVE

Louis G. Gitzendanner, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed Sep. 4, 1984, Ser. No. 646,537
Int. Cl.[4] G11B *5/012*; B01F *3/02*; G05D *21/00*
U.S. Cl. 360—97 **17 Claims**



1. In a disk drive having a housing forming an interior chamber containing a disk and one or more heads for reading and/or writing data on said disk, said disk being rotatable in relation to said heads, the improvement comprising:

a vent tube having a first end outside said housing and a second end in said interior chamber within said housing, said vent tube providing fluid communication between said interior chamber of said housing and atmosphere outside said housing, said vent tube being characterized by having an internal bore large enough so that effects of surface tension and friction between air and water vapor flowing in the vent tube and the surface of the bore of said vent tube are not significant so that flow of air and water vapor in the vent tube is substantially laminar and capillary effects are not significantly present, said vent tube being further characterized by a length long enough to minimize the mass flow rate of water vapor from said atmosphere to said interior chamber, said vent tube being further characterized that pressure gradient across the length of said vent tube is no greater than 0.1 psi; and

a desiccant tube within said internal chamber, said desiccant tube being connected to said second end of said vent tube in fluid communication with said internal bore of said vent tube, said dessicant tube containing a desiccant material which absorbs water.

4,620,249

APPARATUS FOR DRIVING A FLOPPY DISC

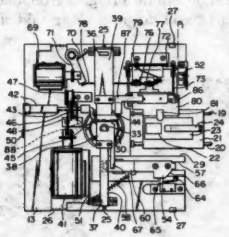
Masayuki Suzaki; Tetsuro Hirota; Tetsuo Kanno, and Takeziro Koguchi, all of Tokyo, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

Filed Apr. 19, 1982, Ser. No. 369,682

Claims priority, application Japan, Apr. 28, 1981, 56-65406; Jun. 25, 1981, 56-98942

Int. Cl.[4] G11B *17/04, 5/012*

U.S. Cl. 360—99 **8 Claims**



8. A floppy disc driving apparatus for automatically driving a floppy disc which is rotated by a driving motor about an opening formed at the center thereof when data are to be recorded in or reproduced from the floppy disc by a head mechanism, comprising:

floppy disc gripping means for drivably gripping the floppy disc at a first predetermined position inside the apparatus;

guide means for guiding the floppy disc into the apparatus in an insertion direction and out of the apparatus in an ejection direction which is opposite to the insertion direction;

biasing means urging the floppy disc out of the apparatus through the guide means in the ejection direction;

stop means for enabling the floppy disc to be manually inserted through the guide means in the insertion direction against a force of the biasing means past the first predetermined position and stopping the floppy disc at the first predetermined position when the floppy disc is subsequently manually released and moved in the ejection direction by the biasing means; and

first sensor means for producing a first signal when the floppy disc has been moved to the first predetermined position by the biasing means and stopped thereat by the stop means, second sensor means for producing a second signal if the floppy disc is oriented in the guide means in a predetermined manner and means for ejecting the floppy disc from the apparatus if the second signal is not produced within a predetermined time after the first signal is produced.

4,620,250

TRANSDUCER-TO-MEDIUM STABILIZING DEVICE AT NEGATIVE ATTACK ANGLE WITH RESPECT TO MEDIUM

Robert G. Hills, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 29, 1984, Ser. No. 594,657

Int. Cl.[4] G11B *5/016, 5/60, 5/48, 23/03*

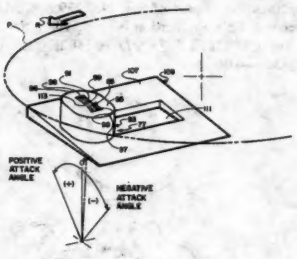
U.S. Cl. 360—102 **5 Claims**

1. In a recording and/or reproducing apparatus of the type provided with (a) means for rotating a flexible storage disk and (b) a record and/or playback head having transducer means for coacting with the disk to record or reproduce information on the disk, the improvement comprising:

a substantially flat air bearing surface for stabilizing the flexible disk as it is rotated over said surface;

means, integral with said air bearing surface, defining a negative pressure cavity having an opening to said surface, for generating a pull down force on successive portions of the rotated disk as each portion is moved over said opening;

means supporting said head in said cavity with said transducer means at said opening; and



means for disposing said air bearing surface at a negative attack angle with respect to the rotated disk for causing the formation of a pull down force along said surface to enhance disk stabilization over said surface and disk pull down at said opening, whereby a stable and intimate transducer-to-disk relation is effected.

4,620,251

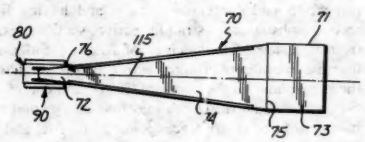
MAGNETIC TRANSDUCER SUPPORT STRUCTURE

Louis G. Gitzendanner, Oklahoma City, Okla., assignor to Magnetic Peripherals Inc., Minneapolis, Minn.

Filed May 13, 1983, Ser. No. 494,224

Int. Cl.[4] G11B *5/60, 15/64*

U.S. Cl. 360—103 **6 Claims**



1. In a magnetic recording system including an apparatus for supporting and selectively positioning a transducer having a surface for flying and a center therein, with respect to a rotatable magnetic disk medium, the improvement comprising:

an actuator selectively rotatable about an axis;

a substantially straight arm rigidly secured to said actuator at a first end of said arm whereby said arm rotates about said axis with said actuator;

a load spring having a first end secured to a second end of said arm; and

a gimbal spring secured to a second end of said load spring, said gimbal spring supporting the transducer with its flying surface adjacent to the recording surface of the magnetic disk medium for reading and/or writing information at locations on said recording surface selected in accordance with rotational movement of said medium and rotation of said actuator;

said arm, transducer flying surface, load spring and gimbal spring being symmetrical about a first line from said axis to the center of said transducer flying surface;

said arm and load spring with said line all extending substantially in the direction of said relative medium movement adjacent the transducer flying surface.

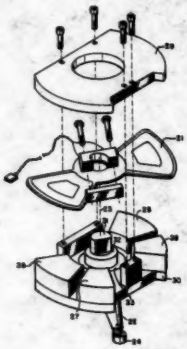
4,620,252
SYMMETRICAL COIL ACTUATOR FOR A MAGNETIC DISK DRIVE

Randall C. Bauck, East Layton, and Peter S. Kleczkowski, Ogden, both of Utah, assignors to Iomega Corporation, Ogden, Utah

Continuation-in-part of Ser. No. 259,696, May 1, 1981, abandoned. This application Nov. 9, 1982, Ser. No. 440,366

Int. Cl.[4] G11B *5/55, 21/08;* **H02K** *33/00, 35/00*

U.S. Cl. 360—106 **9 Claims**



1. A magnetic disk drive actuator for moving a magnetic head in an arcuate path in read/write relationship with a magnetic disk comprising:

an actuator arm rotatable about a center of rotation:

a read/write head mounted on said arm so that said head travels along said arcuate path as said arm is rotated;

a planar coil having only two active sections connected in series and attached to said arm for rotating it about said center of rotation, said planar coil being symmetrical with respect to said center of rotation and having first and second substantially straight active sections extending from one side of said center of rotation and third and fourth substantially straight active sections extending in the same plane on the opposite side of said center of rotation, and symmetrical with said first and second sections having arcuate return traces joining said first and second straight active sections and arcuate return traces joining said third and fourth straight active sections, said active sections and said return traces being connected in series to two connections for supplying current to said coil; and

magnetic means positioned adjacent to each of said active sections of said coil, so that current through said active sections on opposite sides of said center of rotation produces magnetic forces on said coil which act about said center of rotation whereby the rotational forces about the center of rotation are cumulative and the torsional forces cancelled one another avoiding vibration and reducing potential servo loop instability.

4,620,253
LOW MASS ACTUATOR SYSTEM FOR MAGNETIC RECORDING DISK

Richard L. Garwin, Scarsdale, and David A. Thompson, South Salem, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

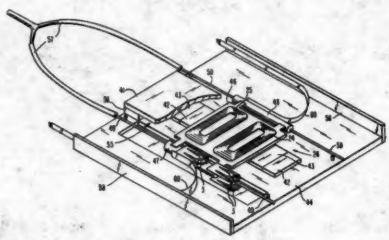
Continuation of Ser. No. 221,607, Dec. 31, 1980, abandoned. This application Jul. 28, 1983, Ser. No. 517,987

Int. Cl.[4] G11B *5/55, 21/08, 5/52, 21/04*

U.S. Cl. 360—107 **3 Claims**

1. In an actuator for use with a magnetic recording disk file including at least one magnetic recording head and at least a pair of stacked magnetic recording disks, said actuator being characterized by:

a motor sufficiently narrow to be positionable between two adjacent stacked disks in a disk file and extending radially across at least one of said pair of disks, said motor including a stator with a magnetic yoke having a plurality of magnets alternating polarity arranged in an array, side-by-side on one arm of said yoke, and an armature adapted to be propelled along said array of magnets, said armature including a pair of flat magnetic coils arranged in side-by-side relationship for bridging from one of said magnets to another of said magnets along said stator, said armature



coacting with said stator and supporting said coupled to said magnetic head;

a head position sensor means whereby said magnetic head reads said track information on a said disk and provides a position signal output in response to said track information and

an automatic control means, for controlling track position of said magnetic recording head over a specific track on a disk of said disk file, said automatic control means being adapted to control the energization of said coils sequentially and alternately as a result of said position signal output of said sensor means, which sensor means provides position information to said automatic control means.

4,620,254
INFORMATION STORAGE AND RETRIEVAL SYSTEM INCLUDING A TAPE CARTRIDGE HAVING A SLIDABLE COVER

Kobert R. Smith, II, Los Altos Hills, Calif., assignor to BSR North America, Ltd., New York, N.Y.

Filed Jan. 4, 1983, Ser. No. 455,473

Int. Cl.[4] G11B *23/02, 23/04*

U.S. Cl. 360—132 **4 Claims**

4. An information storage and retrieval system comprising:

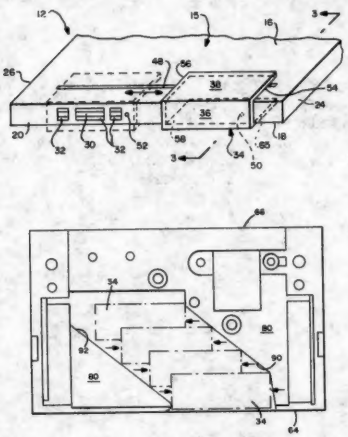
magnetic tape for storing information;

an information retrieval apparatus including a track and means for retrieving said information from said magnetic tape;

A cartridge housing having an interior including said magnetic tape, said housing also having an opening for gaining access to said magnetic tape by said information retrieving apparatus; and

cover means connected with said cartridge housing for movement between a first position closing said opening and a second position uncovering said opening and thereby allowing said information retrieving apparatus to gain access to said magnetic tape, said cover means including camming means comprising a plurality of vertically extending shoulders, each positioned at a predetermined location on said cover means such that said camming means comes in contact with said track when said cartridge housing is inserted into said information retrieving apparatus said track and said camming means being configured such that insertion of said cartridge housing into

said information retrieving apparatus causes said cover means to be moved from said first position at one end of



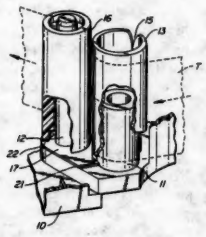
said track to said second position at the other end of said track.

4,620,255

TAPE CARTRIDGE STATIC ELIMINATOR

Randall W. Cook, Palo Alto; Richard E. Rozporka, San Mateo, and Robert S. Jones, San Jose, all of Calif., assignors to Tandy Corporation, Fort Worth, Tex.

Filed Jul. 9, 1984, Ser. No. 629,016
Int. Cl.[4] G11B *23/02*
U.S. Cl. 360—132 5 Claims



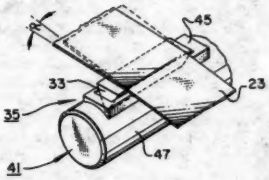
1. A magnetic tape cassette comprising: a housing containing a take-off spool and a take-up spool for magnetic tape, first and second tape guide support pins mounted within said cassette on the take-up spool side of said housing, a stationary metal guide sleeve on said first pin, an electrically conductive plastic guide roller rotatably mounted on said second pin, the magnetic tape path through said cassette housing engaging the back side of said tape against said metal guide sleeve and the magnetic coating side of said tape against said plastic guide roller, and a smooth flat metal member mounted for electrical contact against corresponding ends of said metal sleeve and plastic roller to complete an electrical path therebetween and thereby cancel the electrostatic charges generated on said metal sleeve and the magnetic coating of said tape during transport of said tape between said take-off and take-up spools.

4,620,256

MAGNETIC COMPUTER TAPE CLEANER

Ulyss R. Rubey, Lewisville, Tex., assignor to Media Recovery, Inc., Dallas, Tex.

Filed Jul. 30, 1984, Ser. No. 635,722
Int. Cl.[4] G11B *5/00*; A47K *7/02*
U.S. Cl. 360—137 11 Claims



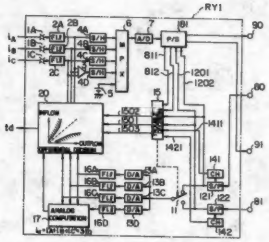
1. In a method of cleaning a computer tape in which the tape traverses past cleaning and wiper means and traversing from a supply reel onto a take-up reel and back, the improvement comprising contacting the tape with an ultrasonically vibrating scraper blade for scrapingly engaging the surface of the tape for removing debris therefrom and improving subsequent tape-to-head contact.

4,620,257

CARRIER RELAY SYSTEM

Yoshihiro Sano, Katsuta; Fumio Iwatani, Hitachi; Takao Kubo, Hitachi, and Yoshiteru Miki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Jul. 20, 1984, Ser. No. 632,846
Claims priority, application Japan, Jul. 21, 1983, 58-134158
Int. Cl.[4] H02H *7/26*
U.S. Cl. 361—68 8 Claims



3. A carrier relay system comprising:

a power system having steel towers supporting power transmission lines together with an overhead ground wire including at least two signal transmission routes extending between a pair of terminal stations;

differential relay means responsive to a current signal detected in one terminal station connected to said two signal transmission routes for detecting trouble in said power system in accordance with a differential current between said current signal in said one terminal station and a current signal transferred from the other terminal station through said signal transmission routes, and including means for outputting a signal to open a current breaker of said one terminal station when trouble has occurred in said power system, a respective differential relay means being disposed at each of said terminal stations;

trouble detection relay means which detects a current or voltage of said one terminal station for detecting trouble in said power system, and for outputting a signal to open

said circuit breaker of said one terminal station when trouble has occurred in said power system, a respective trouble detection relay means being disposed at each of said terminal stations;

signal transmitting means for transmitting a first specific signal to a first one of said signal transmission routes and a second specific signal to a second one of said signal transmission routes in said one terminal station, and for transmitting a third specific signal to said first one of said signal transmission routes and a fourth specific signal to said second one of said signal transmission routes in said other terminal station;

transmission detecting means for detecting a transmission trouble by comparing a specific signal transferred by said one terminal station with a specific signal received from said other terminal station;

means for opening said circuit breaker of said one terminal station when both said differential relay means and said trouble detection relay means output signals, and for inhibiting the opening of said circuit breaker in accordance with an output of said transmission detecting means; and

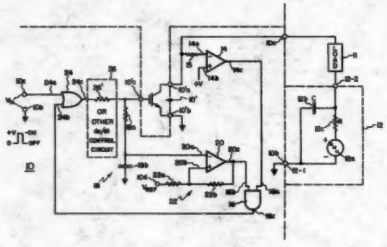
means for opening said circuit breaker when said transmission detecting means detects transmission troubles on said two signal transmission routes and said trouble detection relay means outputs said signal to open said circuit breaker.

4,620,258

CIRCUIT FOR SELF-COMMUTATED TURN-OFF OF LATCHED DEVICES, SUCH AS OF THE INSULATED-GATE TRANSISTOR/RECTIFIER TYPE

Milton D. Bloomer, Scotia, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Mar. 30, 1984, Ser. No. 595,179
Int. Cl.[4] H02H *3/20*
U.S. Cl. 361—91 **14 Claims**



1. A circuit for the self-commutated turning-off of a power switching device of the type having a control electrode and a circuit in which the flow of current is controlled by the magnitude of a drive signal voltage at said control electrode, said controlled-circuit being characterized by latching in be conductive condition at a relatively high current level and remaining latched even in the presence of a turn-off magnitude of the control electrode signal voltage, until the controlled-circuit current is reduced to a holding current substantially less than said latching current, said circuit comprising:

means for monitoring only the voltage across the controlled-circuit of the switching device to provide a first signal responsive to detection of at least a latched condition;

means for monitoring the control electrode signal voltage magnitude to provide respective first and second conditions of a second signal responsive to detection of respective first and second magnitudes of said control electrode signal voltage sufficient to require a respective turning-off and turning-on of current flow through said switching device; and

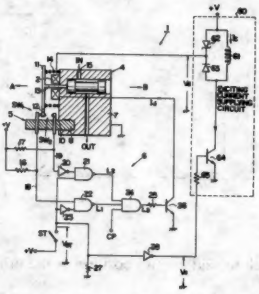
means for cylically pulsing the control electrode signal voltage, responsive only to the presence of both of (1) said first signal and (2) a selected one of said second signal conditions, to cause the switching device to turn off at a current magnitude greater than the device holding current.

4,620,259

CIRCUIT FOR DRIVING SOLENOID VALVE

Hidekazu Oshizawa, Higashimatsuyama, Japan, assignor to Diesel Kiki Co., Ltd., Japan

Filed Dec. 19, 1984, Ser. No. 683,715
Claims priority, application Japan, Dec. 20, 1983, 58-238932
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—152 **10 Claims**



1. A circuit for driving a solenoid valve having a valve which is driven by a current flowing through a solenoid coil to open or close said solenoid valve, comprising:

an ON-OFF switching means which operates in response to the movement of said valve;

means for producing a command signal for controlling the open/close state of said solenoid valve;

a first circuit responsive to a command signal and the operation of said ON-OFF switching means for providing a supply of a stand-by exciting current which intermittently energizes said solenoid coil in such a way that said solenoid valve is substantially maintained in a state just before the open/close state thereof; and

a second circuit responsive to said command signal for supplying a driving exciting current to said solenoid coil to drive said valve to the fully open or closed state of said solenoid valve.

4,620,260

CIRCUIT FOR DRIVING SOLENOID

Hidekazu Oshizawa, and Takeo Kushida, both of Higashimatsuyama, Japan, assignors to Diesel Kiki Co., Ltd., Japan

Filed Dec. 19, 1984, Ser. No. 683,717
Claims priority, application Japan, Dec. 20, 1983, 58-238931
Int. Cl.[4] H01H *47/32*
U.S. Cl. 361—152 **5 Claims**

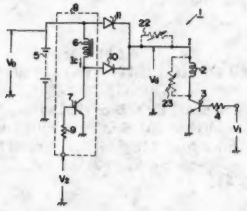
1. A circuit for driving a solenoid, which provides a suddenly standing-up exciting current to the solenoid in order to operate the solenoid at high speed, said circuit comprising:

a d.c. power source;

a first switch connected in series with the solenoid for passing or cutting off the exciting current supplied to the solenoid;

a series circuit composed of a choke coil and a second switch which is switched from its ON state to its OFF state when the first switch is switched from its OFF state to its ON state, said series circuit being connected with said d.c. power source, whereby to produce a counterelectromotive force;

a unidirectional element connected between one end of the choke coil and the solenoid in order to apply to the solenoid the counterelectromotive force produced in the choke coil; and



a voltage limiting element for limiting the level of the transient voltage applied through the unidirectional element to the solenoid and for applying the voltage of the d.c. power source to said solenoid coil, the voltage limiting element being connected between the solenoid and the d.c. power source.

4,620,261

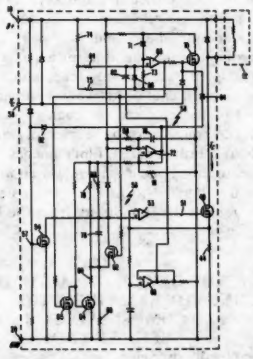
APPARATUS AND METHOD FOR CONTROLLING ELECTROMAGNETIC CLUTCHES AND THE LIKE

James P. Thornton, Dunmore, Pa., assignor to Fairchild Weston Systems, Inc., Archbald, Pa.

Filed Oct. 11, 1984, Ser. No. 659,737

Int. Cl.[4] F16D *27/16*; H01H *47/32*

U.S. Cl. 361—154 **14 Claims**



1. A circuit for supplying driving current to the coil of an electromagnetic device having a movable armature comprising:

means for applying a voltage across said coil to cause a first current to flow therethrough;

means for measuring a change in said first current in response to a change in an electromagnetic characteristic of said device; and

means responsive to said change for applying through said coil and second initially decreasing and then increasing current.

4,620,262

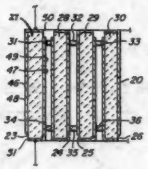
PYROELECTRIC ENERGY CONVERTER ELEMENT COMPRISING VINYLIDENE FLUORIDE-TRIFLUOROETHYLENE COPOLYMER

Randall B. Olsen, 3025 Via de Caballo, Olivenhain, Calif. 92024

Filed Sep. 13, 1984, Ser. No. 650,250

Int. Cl.[4] H01B *3/44*; H02N *1/00*; H01G *4/08*

U.S. Cl. 361—323 **4 Claims**



3. A pyroelectric energy conversion film stack, which essentially consists of films of a copolymer of vinylidene fluoride and trifluoroethylene in a molar ratio of from about 90:10 to about 10:90, the surfaces of said films being substantially covered on both sides with thin metallic electrodes, wherein a separation between adjacent copolymer films is maintained by a screen mesh.

4,620,263

CONTAINER FOR ACCOMMODATING A CONTROL DEVICE

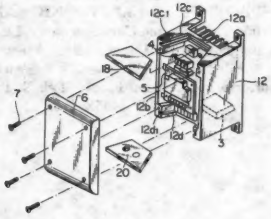
Eizi Ito, Komaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 3, 1984, Ser. No. 596,822

Claims priority, application Japan, Apr. 8, 1983, 58-52189[U]

Int. Cl.[4] H05K *7/20*

U.S. Cl. 361—383 **11 Claims**



1. A control device, comprising:

a control mechanism which rises in temperature during use; and

a container including:

a die cast aluminum housing having radiator fins, said housing containing said control mechanism therein, said housing having a side surface having an opening therein for obtaining access therethrough to the interior thereof, and opposite top and bottom surfaces, said top and bottom surfaces respectively having top and bottom cut-away portions,

a cover plate covering said opening mounted to said housing over said opening, said housing and cover plate forming means for sealing the interior of said housing except through said cut-away portions, and

top and bottom protective covers attached to said housing respectively covering said top and bottom cut-away portions.

4,620,264

MULTI-LAYER CERAMIC WIRING CIRCUIT BOARD AND PROCESS FOR PRODUCING THE SAME

Nobuyuki Ushifusa; Satoru Ogihara, both of Hitachi, and Kosei Nagayama, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1984, Ser. No. 685,133
Claims priority, application Japan, Dec. 23, 1983, 58-243351
Int. Cl.[4] H05K 1/03
U.S. Cl. 361—414 10 Claims

1. A multi-layer ceramic wiring circuit board, comprising:

a plurality of ceramic insulating substrate layers;

at least one wiring conductor layer betweeen selected ceramic insulating substrate layers, said plurality of insulating substrate layers and said at least one wiring conductor layer forming a laminated stack having at least one outer ceramic insulating substrate layer and at least one inner ceramic insulating substrate layer, said at least one inner ceramic insulating substrate layer contacting at least one selected wiring conductor layer; wherein,

said at least one inner ceramic insulating substrate layer has a relative dielectric constant less than or equal to 6.0 and a relative density of less than 90%;

said at least one outer ceramic insulating substrate layer has a tensile strength of at least 4 kgf/mm^2 and a relative density greater than or equal to 90%; and

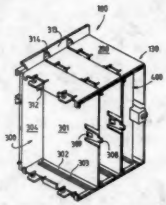
said at least one outer ceramic insulating substrate layer is made of a material containing the same compounds as are contained in the material of which said at least one inner ceramic insulating layer is made.

4,620,265

MODULAR CELL FOR SUPPORTING AND PROTECTING ELECTRONIC CARDS

Gérard Lerude, Antibes, and Christine Roux, Le Rouret, both of France, assignors to La Telemecanique Electrique, France

Filed Feb. 7, 1985, Ser. No. 699,097
Claims priority, application France, Feb. 9, 1984, 84 01915
Int. Cl.[4] H05K 5/02
U.S. Cl. 361—424 15 Claims



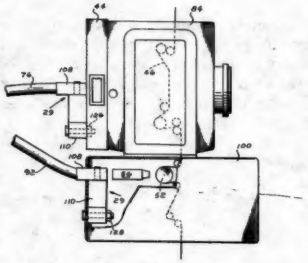
1. A modular cell for supporting and protecting electronic cards comprising a flat element or blank having two parallel side edge portions, a front edge portion and a rear edge portion; a bottom extending perpendicularly to said blank from said rear edge portion and two lateral sides extending perpendicularly to said blank respectively from said two side edge portions, said lateral sides having card guide means forming two respective lateral slides parallel to the blank and at a small distance therefrom, the spacing of these two slides being provided so that the cards may be engaged therein by two of their opposite lateral edge portions and may slide therein, further comprising fixing means for holding said card in position with respect to said blank, once the card has reached its position of use inside the cell at the end of its sliding travel in said slides, said fixing means comprising snap fit means provided on the blank cooperating with corresponding snap fit means provided on or added to the card.

4,620,266

FIBER-OPTIC LIGHT SYSTEM FOR MOVIE PROJECTORS

Richard R. Baumann, P.O. Box 19, Dalton, Mass. 01226, and Richard I. Eldridge, 551 South St., Pittsfield, Mass. 01201

Filed May 11, 1984, Ser. No. 609,789
Int. Cl.[4] F21V 7/04
U.S. Cl. 362—32 11 Claims



1. A fiber-optic light system for projectors and sound reproducers comprising:

(a) a fiber-optic light source;

(b) a plurality of fiber-optic cables attached adjacent to the light source for transmitting fiber-optic light through them, wherein each of the cables has one end connected adjacent to the light source and an opposite, free end with a coupler fixedly attached to it;

(c) a plurality of projectors and reproducers sound sets, wherein each set comprises a projector and an associated reproducer sound head; and,

(d) said projectors and sound heads each having an attached mount adapted to removably receive one of said couplers and its attached cable end, wherein a cable is removably attached to the projector of each of said projector and reproducer sound sets by a pair of said couplers and mounts to transluminate a film's images from a set's projector onto an adjacent screen and another cable can be removably attached to that projector's associated sound head to release the soundtrack from the film.

4,620,267

CORRECTOR DEVICE FOR AUTOMATICALLY CORRECTING THE BEAM DIRECTION OF VEHICLE HEADLAMPS TO COMPENSATE FOR VARIATIONS IN VEHICLE TRIM

Pierre Cibie, Neuilly sur Seine, France, assignor to Cibie Projecteurs, France

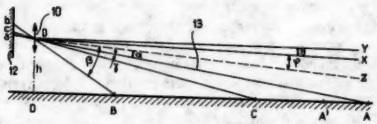
Filed Dec. 11, 1985, Ser. No. 807,543
Claims priority, application France, Dec. 14, 1984, 84 19172
Int. Cl.[4] B60Q 1/08
U.S. Cl. 362—71 30 Claims

1. A device for automatically correcting the beam direction of a vehicle headlamp when the trim of said vehicle changes, said device comprising:

an illumination sensor integrated in the vehicle headlamp and fixed to move therewith, said sensor being disposed to detect the luminance of the road in at least one direction at a predetermined angle with the horizontal, said luminance

being detected in a region of the road lying in the field illuminated by the headlamp, and said sensor being suitable for generating a signal representative of said detected luminance;

an actuator for varying the inclination of the headlamp sensor assembly relative to the vehicle; and



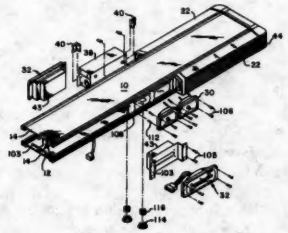
processor means for generating an actuator control signal as a function of the signal generated by said sensor, in such a manner as to servocontrol sdaid region of the road to have constant luminance.

4,620,268

LOW-PROFILE MODULAR LIGHTBAR ASSEMBLY

Robert A. Ferenc, Middletown, Conn., assignor to Whelen Engineering Co., Inc., Deep River, Conn.

Filed Feb. 13, 1984, Ser. No. 579,781
Int. Cl.[4] B60Q *3/02*
U.S. Cl. 362—74 **19 Claims**



1. A warning light system comprising:

housing means, said housing means including a monolithic generally I-shaped elongated support member, said support member being defined by a planar central web portion and adjoining upper and lower flange portions which cooperate to define a pair of oppositely facing open-sided channels, the edge regions of said flange portions being provided with connector means;

a plurality of light generator means mounted at different laterally spaced positions along said support member, said light generator means being at leasf in part positioned within said open-sided channels in said support member;

a plurality of light transmissive cover means, said cover means being generally C-shaped and having edge portions which cooperate with said support member connector means to mount said plural cover means on said support member on opposite sides thereof, said cover means extending over said light generator means; and

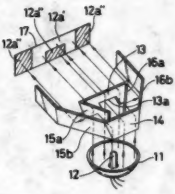
spacer means for providing a sealed joint between adjacent ones of said cover means on a common side of said support member, said spacer means engaging said adjacent cover means and said support member connector means.

4,620,269

HEADLAMP FOR VEHICLE

Hiroo Oyama, Sagamihara, Japan, assignor to Stanley Electric Co., Ltd., Tokyo, Japan

Filed Jul. 26, 1985, Ser. No. 759,651
Claims priority, application Japan, Aug. 3, 1984, 59-163732
Int. Cl.[4] B60Q *1/04*
U.S. Cl. 362—80 **16 Claims**



1. A vehicle lamp, comprising:

a housing having a front portion, a rear portion and a lower portion;

a revolution paraboloidal reflector attached to said lower portion of said housing and facing in the upward direction;

a laterally extending rectangular shaped front lens located in said front portion of said housing and facing in a direction substantially perpendicular to said paraboloidal reflector;

a lamp located so that the position of a filament thereof is at the focus of said revolution paraboloidal reflector, whereby light produced by said lamp is formed into an upwardly directed light beam by said paraboloidal reflector in the axial direction of said paraboloidal reflector;

a substantially flat front reflector mounted above said paraboloidal reflector in the axial direction of said paraboloidal reflector and reflecting a first portion of said light beam from said paraboloidal reflector toward said front portion of said housing with a reflecting angle of about 90° so that light reflected by said front reflector impinges said front lens;

a substantially flat back reflector mounted above said paraboloidal reflector in the axial direction of said paraboloidal reflector, and spaced rearwardly of said front reflector in a direction substantially perpendicular to said axial direction of said paraboloidal reflector, said back reflector being arranged to reflect a second portion of said light beam from said paraboloidal reflector toward said front portion of said housing with a reflecting angle of about 90° so that light reflected by said back reflector impinges said front lens; and

two pairs of additional substantially flat reflectors mounted adjacent said front and back reflectors and on respective opposite sides of said front and back reflectors, for reflecting and changing the course of some of the light reflected by said back reflector to pass around said opposite sides of said front reflector and toward said front lens.

4,620,270

DECORATIVE SIMULATED TREE LIGHTING APPARATUS

John K. Laakso, 3456 Fairview Court, Kennesaw, Ga. 30144

Filed Jun. 17, 1985, Ser. No. 745,864
Int. Cl.[4] A47G *33/06*
U.S. Cl. 362—123 **17 Claims**

1. A lighting apparatus for decorating a structure comprising:

a multi-piece base member having a ring shape and positioned on a surface,

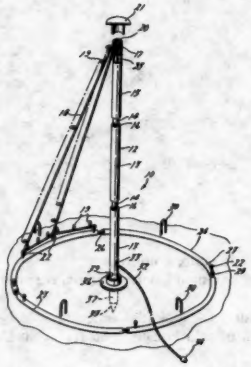
means for releasably securing said base member onto said surface,

central support means positioned substantially at the center

of said base member and positioned and supported above said base member,

at least one string of lights releasably secured to said support means and said base member,

means on said base member for releasably securing said string of lights to said base member,



means on said support means for releasably securing said string of lights to said support member, wherein said string of lights is suspensionally supported between said support means and base member.

4,620,271

CIRCUIT ARRANGEMENT FOR FEEDING ELECTRICAL USERS VIA A SWITCH CONTROLLER

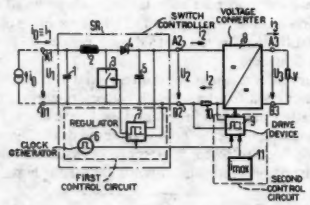
Gerhard Musil, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jul. 9, 1985, Ser. No. 753,115

Claims priority, application Fed. Rep. of Germany, Jul. 13, 1984, 3425903

Int. Cl.[4] H02M *3/335*

U.S. Cl. 363—21 **7 Claims**



1. A circuit arrangement for feeding electrical users with a DC voltage, comprising:

at least one user connected via a switch controller means to a feed circuit fed with an impressed current;

said switch controller means having a switch element controllable with switch pulses produced by a first control circuit means dependent on a DC voltage at its output;

said switch controller means maintaining said DC voltage at its output at least approximately constant;

the switch element being connected parallel to an input of the switch controller means;

a diode between the switch element and a capacitor connected parallel to an output of the switch controller means;

said diode being poled such that the diode is inhibited given a conductive switch element;

a voltage converter means connected between an output of the switch controller means and said at least one user;

a current sensor means for sensing feed current of the voltage converter means;

the voltage converter means being controllable by said current sensing means and by a second control circuit means connected to said current sensor means such that is emits a reduced output voltage given a feed current of the voltage converter means above a prescribed limit value of the feed current; and

said prescribed limit value of the feed current being lower than said impressed current.

4,620,272

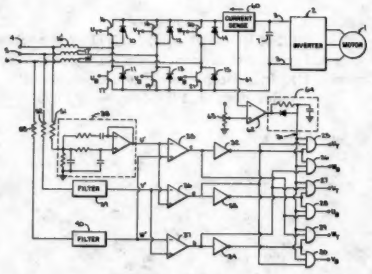
LINE-REGENERATIVE MOTOR CONTROLLER WITH CURRENT LIMITER

Donald E. Fulton, Stoneham, and Stanley P. Sassower, Natick, both of Mass., assignors to IMEC Corporation, Boston, Mass.

Filed Aug. 31, 1984, Ser. No. 646,411

Int. Cl.[4] H01H *7/12*

U.S. Cl. 363—53 **5 Claims**



1. A power converter for a motor control system, the combination comprising:

a set of three inductors, each connected to respective ones of three power lines;

a three-phase diode bridge having three legs, each leg being connected across a pair of output terminals, and each leg having a pair of series connected diodes with the juncture of each diode pair being connected to respective ones of the three inductors;

a set of six solid state switches, each solid state switch being connected in parallel with respective ones of the diodes to conduct current in the opposite direction as the diode when a control signal is applied to a control terminal on the solid state switch;

a DC bus connected to the output terminals of the three-phase diode bridge and coupled to a motor to provide current to the motor and to receive current from the motor during regeneration; and

a converter control circuit having inputs connected to the power lines and including:

(a) comparator means for determining which of the three power lines has the highest voltage at any moment in time and which of the three power lines has the lowest voltage at any moment in time,

(b) gate means connected to the comparator means and being operable to produce control signals for the solid state switches which enable regenerated current to be conducted to the pair of power lines having the maximum line-to-line voltage at any moment in time, and

(c) current limiting means coupled to the DC bus to sense

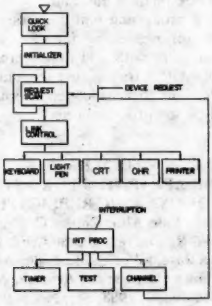
the magnitude of the current flowing therein and coupled to the gate means to disable the production of said control signals when the magnitude of the sensed current exceeds a preselected limit, wherein the current limiting means includes a time delay circuit which disables the production of said control signals for a preselected time interval after the sensed current exceeds the preselected limit.

4,620,273

TERMINAL CONTROL SYSTEM AND METHOD OF TERMINAL CONTROL

Katsuya Mitani; Toshihiro Sano; Nobutaka Nomura; Kou Numata, and Megumi Utino, all of Hadano, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1982, Ser. No. 356,922
Claims priority, application Japan, Mar. 13, 1981, 56-35334
Int. Cl.⁴ G06F *15/46*
U.S. Cl. 364—136 **26 Claims**



1. A terminal processing system for process control comprising:

at least a first terminal including a first memory;

a terminal control device including a second memory, wherein said second memory is programmed to store a first predetermined program including instructions for performing a first set of predetermined operations at said first terminal and a second predetermined program including instructions for modifying said first program to make predetermined changes to the first set of predetermined operations at said first terminal;

means coupled to said terminal control device for selecting a first portion of said second predetermined program which is to be utilized by said first terminal for modifying said first set of predetermined operations at said first terminal in a predetermined manner; and

means for transferring said first program and only said first portion of said second program determined by said selecting means from said second memory in said terminal control device to said first memory in said first terminal.

4,620,274

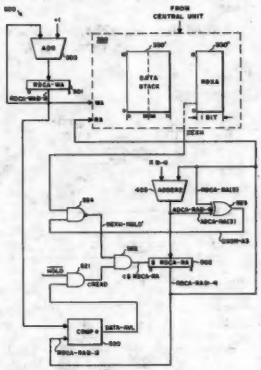
DATA AVAILABLE INDICATOR FOR AN EXHAUSTED OPERAND STRING

Donald C. Boothroyd, Phoenix, and Robert W. Norman, Jr., Glendale, both of Ariz., assignors to Honeywell Information Systems Inc., Phoenix, Ariz.

Filed Apr. 1, 1983, Ser. No. 481,227
Int. Cl.⁴ G06F *9/34*
U.S. Cl. 364—200 **4 Claims**

1. In a data processor, which executes a predetermined instruction on a predetermined operand as indicated by an instruction word, said operand being a variable length data string made up of at least one computer word, the execution of the instruction being performed by said data processor in a sequential series of steps wherein at least one step is performed in a predetermined time period, said time period being a cycle of said data processor, and wherein at least one cycle is required to read said operand stored in a memory device of said data processor, said memory device having a plurality of addressable locations, said variable length data string being temporarily stored in at least one addressable location of said memory device, said data processor further including an apparatus for providing a control signal to indicate the end of the variable length data string thus inhibiting further reads of the variable length data string without inhibiting the subsequent steps of the cycles associated with the execution of the instruction thereby allowing the execution of the instruction to complete, said apparatus comprising:

(a) memory means, having a plurality of addressable locations, each of said pluraity of addressable locations corresponding to a respective addressable location of said memory device, for storing information to generate said control signal when the stored information indicates the corresponding addressable location of the memory device is the last computer word of the variable length data string; and

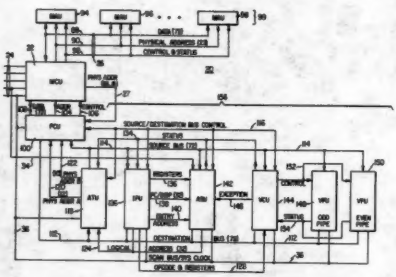


(b) register means for temporarily storing a read address value, said register means having an input terminal adapted to receive the read address value, the read address value corresponding to an addressable location of said memory device containing the computer word of the variable length data string to be read in the execution of the instruction, said register means further having a strobe input terminal operatively connected to said memory means whereby said control signal is operatively coupled to said register means to control the loading of an updated read address value into said register means in response to said control signal.

4,620,275
COMPUTER SYSTEM

Steven J. Wallach, 7314 Westerway, Dallas, Tex. 75248; Thomas M. Jones, 6050 Glen Heather, Dallas, Tex. 75252; Frank J. Marshall, 2316 Crossbend Rd., Plano, Tex. 75023; David A. Nobles, 3514 Corona, Garland, Tex. 75042; Kent A. Fuka, 1823 Treeline Dr., Carrollton, Tex. 75007; Steven M. Rowan, 1817 Greensprings Cir., Garland, Tex. 75042; William H. Wallace, 2412 Peachtree La., Plano, Tex. 75074; Harold W. Dozier, 2218 Ridgewood, Carrollton, Tex. 75006; David M. Chastain, 1208 Serenade Cir., Plano, Tex. 75075; John W. Clark, 1927 Oak Bluff Dr., Carrollton, Tex. 75007; Robert B. Kolstad, 6069 Beltline Rd., #1049, Dallas, Tex. 75240; James E. Mankovich, 2808 Pepper Tree, Plano, Tex. 75074; Michael C. Harris, 3309 Meadow Wood, Bedford, Tex. 76021; Jeffrey H. Gruger, 14151 Montfort, #217, Dallas, Tex. 75240; Alan D. Gant, 3615 Aries Dr., Garland, Tex. 75042; Harold D. Shelton, 2203 Stone Brook, Carrollton, Tex. 75007; James R. Weatherford, 5500 Knights Ct., Lake Dallas, Tex. 75065; Arthur T. Kimmel, 4322 Windward Cir., Dallas, Tex. 75252; Gary B. Gostin, 571 Havencrest La., Coppell, Tex. 75019; Gilbert J. Hansen, 3104 Bonnie Brook Dr., Plano, Tex. 75075; John M. Golenbieski, 5840 Spring Valley Rd., #208, Dallas, Tex. 75240; Larry W. Spry, 7604 Fair Oaks, #2061, Dallas, Tex. 75231; Gerald Matulka, 2004 Albert, Carrollton, Tex. 75007; Gaynel J. Lockhart, 1309 Chesterton Dr., Richardson, Tex. 75080, and Michael E. Sydow, 2004 Albert, Carrollton, Tex. 75007

Filed Jun. 20, 1984, Ser. No. 622,451
Int. Cl.[4] G06F *9/18*
U.S. Cl. 364—200 **6 Claims**

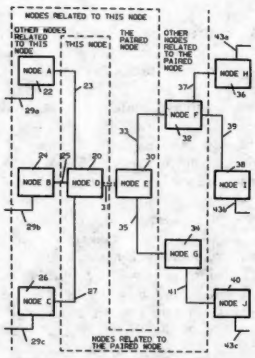


1. A computer system, comprising:
- a main memory having operands stored therein and identified by physical addresses,
- a memory control unit;
- a memory bus connecting said main memory to said memory control unit,
- a I/O bus connected to said memory control unit,
- a service processing unit connected to said I/O bus for providing initialization, operator access and system timing for said computer,
- at least one I/O processor connected to said I/O bus for supplying data to and receiving data from said computer,
- a physical cache unit connected to communicate with said memory control unit for the transfer of operands and addresses therethrough, said physical cache having operands stored therein and identified by physical addresses,
- a source bus in communication with said physical cache unit,
- a destination bus in communication with said physical cache unit,
- a logical address bus,
- an address translation unit for receiving logical addresses via said logical address bus and producing therefrom corresponding physical addresses which are transmitted to said physical cache unit;
- an instruction processing unit for storing and decoding machine instructions received from said main memory via said source bus, said instruction processing unit producing instruction execution commands from said machine instructions,
- an address scalar unit having microinstructions stored therein for executing scalar machine instructions as determined by the instruction execution commands received from said instruction processing unit, said address scalar unit generating logical address for transmission over said logical address bus,
- a vector control unit having microinstructions stored therein for executing vector machine instructions as determined by the instruction execution commands received from said instruction processing unit, said vector control unit for decoding the microinstructions stored therein and producing vector control commands therefrom, said vector control unit connected to said source and destination buses,
- a first vector processing unit connected to receive said vector control commands from said vector control unit for processing vector operands received from said source bus and producing resultant operands for transmission through said destination bus, and
- a second vector processing unit connected in parallel with said first vector processing unit for processing vector operands currently with said first vector processing unit wherein the vectors transmitted through said source bus have the elements thereof loaded alternately in said first and second vector processing units.

4,620,276
METHOD AND APPARATUS FOR ASYNCHRONOUS PROCESSING OF DYNAMIC REPLICATION MESSAGES

Thomas P. Daniell, Palo Alto; Robert C. Harding, Jr., Cupertino; Roger W. R. Harvey, Santa Cruz, and Sven H. H. Nauckhoff, San Jose, all of Calif., assignors to International Business Machine Corporation, Armonk, N.Y.

Filed Jun. 2, 1983, Ser. No. 500,582
Int. Cl.[4] G06F *9/00*
U.S. Cl. 364—200 **17 Claims**



1. A method for operating a computing apparatus as this node in a multiprocessing system having at least one paired node, this node including means for receiving request messages with respect to the paired node, comprising the steps executed at this node of:
- generating a first rank value;
- receiving from said paired node a second rank value;
- associating said first and second rank values with a data atom replicated at said this node and said paired node;
- receiving a request message from said paired node, the request message including a third rank value, a fourth rank value, and a request;
- the first and third rank values being indicative of a significant event time at this node and the second and fourth

rank values being indicative of a significant event time at paired node; and

comparing said first and second rank values with said third and fourth rank values, respectively, and selectively processing said request based upon their correspondence.

4,620,277

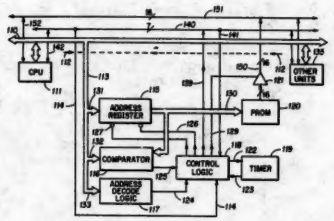
MULTIMASTER CPU SYSTEM WITH EARLY MEMORY ADDRESSING

Jimmie L. Fisher, Phoenix, Ariz.; Mark A. Kovalan, Cedar Rapids, and Bryon L. Wiscons, Marion, both of Iowa, assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Feb. 28, 1983, Ser. No. 470,695

Int. Cl.⁴ G06F *12/00*

U.S. Cl. 364—200 **1 Claim**



1. A data processing system comprising in combination:

a. a plurality of central processing units interconnected via a bus;

b. a plurality of memory units interconnected via said bus to said central processing units; and

c. at least one of said memory units comprising a sequential memory address generator and said at least one of said memory units being enabled by a single one of said plurality of central processing units and having a means to receive and store a first memory address and a second subsequent memory address, respectively, therefrom, wherein said at least one memory unit further comprises:

i. a sequential and artificial memory address generator for generating a sequential memory address, which is a single least significant bit different from said first memory address received, and directly applying said sequential memory address to said memory in anticipation of receipt of said second memory address from one of said plurality of central processing units;

ii. means for comparing said second received memory address from one of said plurality of central processing units to said sequentially generated memory address; and

iii. means for allowing said direct application of said sequential memory address to continue as a function of a correct compare of said second received memory address with said sequentially generated memory address.

4,620,278

DISTRIBUTED BUS ARBITRATION ACCORDING EACH BUS USER THE ABILITY TO INHIBIT ALL NEW REQUESTS TO ARBITRATE THE BUS, OR TO CANCEL ITS OWN PENDING REQUEST, AND ACCORDING THE HIGHEST PRIORITY USER THE ABILITY TO STOP THE BUS

James G. Ellsworth, and Thomas E. Wulling, both of St. Paul, Minn., assignors to Sperry Corporation, New York, N.Y.

Filed Aug. 29, 1983, Ser. No. 527,063

Int. Cl.⁴ G06F *13/36*

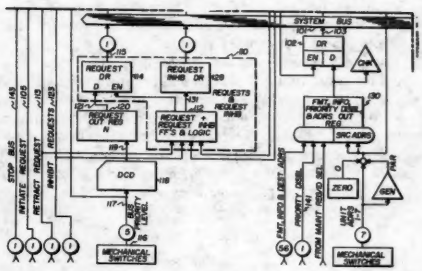
U.S. Cl. 364—200 **12 Claims**

1. In a digital communication system including a digital communication bus and a plurality of bus User devices communicably interconnected to said bus by a like plurality of bus interface logic circuits, which bus interface logic circuits do, responsively to initiation by the associated bus User device, perform distributed arbitration for ownership of said digital communication bus, an improvement to said bus interface logic circuits performing distributed arbitration to the end that one such said bus interface logic circuit should be able to preclude that other said bus interface logic circuits should newly enter said distributed arbitration, said improvement within each said bus interface logic circuits comprising:

request inhibit flip-flop means for receiving a true condition request inhibit control signal from said associated bus User device that desires to preclude that the bus interface logic circuits associated with other ones of said bus User devices should newly enter into distributed arbitration, and for storing said true condition request inhibit control signal until such time as said distributed arbitration is won for said associated User device;

request inhibit signal drive means for, conditionally upon entrance into said distributed arbitration responsively to said initiation by said associated bus User device, driving said true condition of said request inhibit control signal as stored within said request inhibit flip-flop means as a true REQUEST INHIBIT signal upon a dedicated signal line of said digital communications bus; and

request inhibit signal receiver and preclusion means for receiving said true REQUEST INHIBIT signal upon said



dedicated signal line of said digital communication bus, and for responsively thereto the duration of said true REQUEST INHIBIT signal suspending, or precluding, that, responsively to the initiation of said associated bus User device, said distributed arbitration should be newly entered;

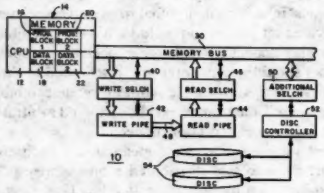
whereby that bus interface logic circuit receiving a true condition request inhibit control signal cannot preclude itself from newly entering said distributed arbitration because said driving of said true condition of said REQUEST INHIBIT control signal upon said bus by that bus interface logic circuit is conditional upon having already made entrance into said distributed arbitration;

whereby ones of said plurality of bus interface logic circuits as have not already made, responsively to said initiation by associated ones of said plurality of bus User devices, entrance into said distributed arbitration by that time of said receiving of said true REQUEST INHIBIT signal upon said dedicated signal line are thereafter precluded from doing so until such time as that said bus interface logic unit which did receive said true condition request inhibit control signal from the associated User device has won said distributed arbitration for said associated User device, and does no longer store said true condition request inhibit control signal.

4,620,279
DATA TRANSFER SYSTEM

Randol R. Read, Tulsa; Everett L. Cox, Broken Arrow, and Randall L. Selzler, Tulsa, all of Okla., assignors to Standard Oil Company, now Amoco Corporation, Chicago, Ill.

Filed Jul. 29, 1983, Ser. No. 518,518
Int. Cl.[4] G06F *13/28*
U.S. Cl. 364—200 **20 Claims**



1. A data transfer method for use with a computer system comprising at least one processor, a memory system coupled to the at least one processor, and at least first and second selector channels, each coupled to the memory system, said method comprising the following steps:

providing a hardware interconnection between the first and second selector channels to allow digital information to be transferred directly from the first selector channel to the second selector channel;

running a first program on the computer system to generate a first set of digital data and to store said first set in a first portion of the memory system;

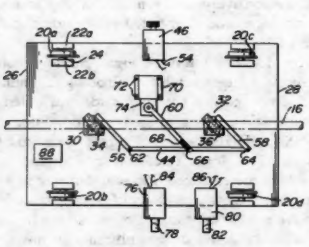
running a second program on the computer system, asynchronously with respect to said first program, said second program adapted to process the first set of digital data as stored in a second portion of the memory system; and

utilizing the first and second selector channels and the hardware interconnection to transfer the first set of digital data in the first portion of the memory system directly to the second portion of the memory system, without intermediate mass storage.

4,620,280
INTELLIGENT DRIVERLESS VEHICLE

Barry C. Conklin, Easton, Pa., assignor to SI Handling Systems, Inc., Easton, Pa.

Filed Jul. 29, 1983, Ser. No. 518,570
Int. Cl.[4] B61L *27/00*; G06F *15/50*
U.S. Cl. 364—426 **16 Claims**



1. Apparatus comprising:

(a) a vehicle mounted on support wheels adapted to ride on a track;

(b) drive wheel means mounted on said vehicle, said drive wheel means including a drive wheel oscillatible between a drive position and an accumulation position;

(c) a slave computer associated with said vehicle;

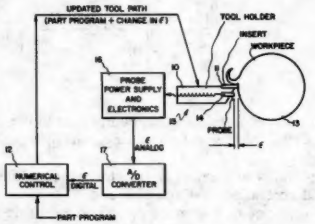
(d) drive wheel control means disposed on said vehicle, said drive wheel control means having an output shaft movable in response to signals generated by said slave computer;

(e) a control linkage operatively connected to said drive wheel means and to said output shaft, said control linkage being responsive to movement of said output shaft to oscillate said drive wheel between said drive position and said accumulation position; whereby the movement of said vehicle is regulated by adjusting said drive wheel position in accordance with signals provided by said slave computer.

4,620,281
IN-PROCESS CUTTING TOOL CONDITION COMPENSATION AND PART INSPECTION

Robert A. Thompson, Quaker Street, and Richard W. Breuning, Scotia, both of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 304,495, Sep. 22, 1981, abandoned. This application Feb. 15, 1984, Ser. No. 580,316
Int. Cl.[4] G05B *19/24*
U.S. Cl. 364—475 **6 Claims**



1. An in-process method of monitoring and compensating for the condition of a cutting tool on a numerically controlled machine tool which has a cutting tool-tool holder assembly that follows a part program, comprising:

mounting a displacement sensor on said cutting tool-tool holder assembly and continuously measuring the distance to a freshly cut surface on a workpiece during a cutting and chip-forming operation while executing the part program, and generating a probe signal representing sensed distance;

processing said probe signal to produce cutting tool condition signals including a wear signal that indicates the amount of tool wear perpendicular to the workpiece axis; and

adjusting the location of the point of said cutting tool during the cutting and chip-forming operation to compensate for tool wear, the updated tool path being given by the part program plus the change in sensed distance.

4,620,282
SYSTEM AND METHOD FOR DOCUMENTING AND CHECKING CABLE INTERCONNECTIONS

Marlin C. Shelley, 2641 Edgehill Dr., Bountiful, Utah 84010

Filed Feb. 3, 1984, Ser. No. 576,612
Int. Cl.[4] G06F *11/00*
U.S. Cl. 364—489 **31 Claims**

1. A method of documenting the terminal interconnections for each wire of a newly designed cable and for later checking the terminal interconnections for each wire of another cable that is to be used as a reference cable for checking subsequent cables so as to verify that the terminal interconnections of said cables are the same, said method comprising the steps of:

electronically determining the terminal interconnections for said newly designed cable;

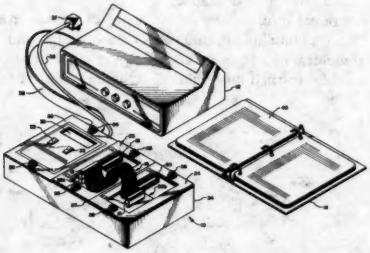
electronically generating a unique cable signature based on

the terminal interconnections determined for said newly designed cable;

documenting said cable signature and the terminal interconnections for said newly designed cable;

electronically determining and storing the terminal interconnections for said reference cable;

electronically generating a unique cable signature based on the terminal interconnections determined for said reference cable;



comparing said cable signature of said reference cable to said cable signature documented for said newly designed cable so as to verify that said reference cable has the same signature as the newly designed cable; and

thereafter electronically determining and comparing the terminal interconnections for each said subsequent cable to the terminal interconnections stored from said verified reference cable.

4,620,283

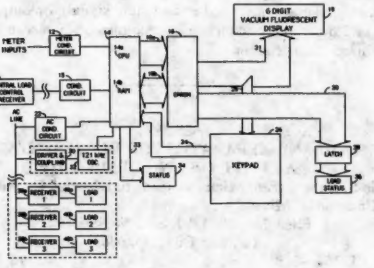
PROGRAMMABLE LOAD CONTROLLER

James A. Butt; Kalyan Mondal, and Preston L. Roberts, all of Allentown, Pa., assignors to Lehigh University, Bethlehem, Pa.

Filed Nov. 29, 1983, Ser. No. 555,960

Int. Cl.[4] G06F *15/56*; H04B *3/54*; H02J *13/00*

U.S. Cl. 364—493 **27 Claims**



1. A control method for minimizing during a billing period the on-peak power demand of a residential electric utility customer having an AC line and a plurality of interruptible non-priority loads and non-interruptible priority loads comprising the steps of:

(a) defining a control point of desired power demand;

(b) shedding non-priority loads to attempt to decrease demand below the control point;

(c) providing predetermined sliding time windows;

(d) determining average energy demand of the loads over a predetermined sliding time window; and

(e) dynamically increasing said control point to a new control point when all non-priority loads have been shed and when the average power demand within the time window increases beyond said control point whereby the value of the new control point is related to the last-named average power demand.

4,620,284

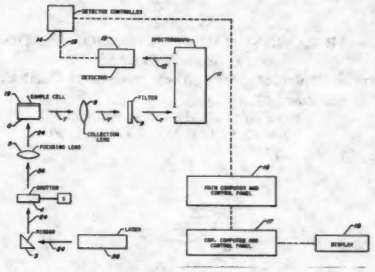
QUALITATIVE AND QUANTITATIVE ANALYSIS USING RAMAN SCATTERING

Robert P. Schnell, Deerfield; Robert W. Sampson, Wayne; Ronald F. Pacanowski, Hoffman Estates, and Donald J. Bruggema, Wheeling, all of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1983, Ser. No. 566,842

Int. Cl.[4] G06F *15/20*; G01J *3/44*

U.S. Cl. 364—498 **32 Claims**



18. Apparatus for determining the composition of an unknown sample comprising:

(a) means for producing a beam of photons which is substantially monochromatic and impinges on the unknown sample;

(b) means for collecting photons scattered by the unknown sample into a stream of scattered photons;

(c) means for resolving the photon stream into its component frequencies to form a Raman spectrum of the unknown sample;

(d) means for converting said unknown sample Raman spectrum to digital form and transmitting said unknown spectrum to computing means;

(e) said computing means, which contain reference spectra obtained in the same manner as said unknown spectrum, where the reference spectra are of reference samples whose composition is known; and,

(f) means within the computing means for identifying substances present in the unknown sample by comparing said unknown spectrum to the reference spectra, said computing means accomplishing said comparison by performing the following functions:

(i) inspecting the unknown spectrum and selecting a plurality of separate spectral analysis regions;

(ii) determining a size characteristic associated with each spectral analysis region of the unknown spectrum;

(iii) searching the reference spectra and choosing those reference spectra having in the selected spectral analysis regions features corresponding to those of the selected spectral analysis regions of the unknown spectrum and size characteristics substantially identical to those of the selected spectral analysis regions of the unknown spectrum;

(iv) if more than one reference spectrum is chosen, repeating functions (f)(i), (f)(ii), and (f)(iii), selecting additional regions, until only one reference spectrum is chosen, the substances present in said one chosen reference spectrum being present in the unknown sample;

(v) if no reference spectrum is chosen, establishing a number of working hypothesis, each hypothesis being that the unknown sample consists of a different combination of the reference samples which exhibited the spectra

chosen to have features corresponding to those of the selected regions of the unknown spectrum;

(vi) testing each working hypothesis by combining the spectra of the hypothesis to produce a single hypothetical spectrum and comparing it to the unknown spectrum;

(vii) discarding each working hypothesis which is not substantially identical to the unknown spectrum; and,

(viii) if more than one working hypothesis has not been discarded, repeating functions (f)(v) through (f)(viii), selecting additional regions, until only one working hypothesis has not been discarded, the unknown sample composition then being that of said one remaining working hypothesis.

4,620,285

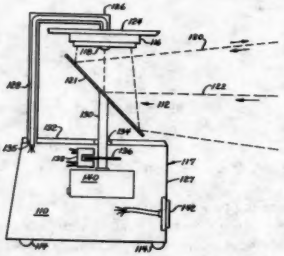
SONAR RANGING/LIGHT DETECTION SYSTEM FOR USE IN A ROBOT

Terry A. Perdue, St. Joseph, Mich., assignor to Heath Company, St. Joseph, Mich.

Filed Apr. 24, 1984, Ser. No. 603,471

Int. Cl.[4] G06F *15/50*; G05D *1/00*

U.S. Cl. 364—513 **26 Claims**



1. For use in a robot, a sensor system comprising:

a first acoustic transducer for transmitting and receiving acoustic signals;

a light detector responsive to a light signal incident thereon;

a rotating reflector rotatable through 360° and positioned adjacent said first acoustic transducer and said light detector for directing the acoustic signals transmitted by the transducer outward from said robot and for directing light signals and acoustic signal echoes incident on said reflector to said light detector and to said first acoustic transducer, respectively;

rotation sensing means coupled to said rotating reflector for determining the angular position thereof;

a controller coupled to said rotating reflector and to said sensing means for controlling the angular position of said reflector; and

a second fixed acoustic transducer positioned on a forward portion of the robot and coupled to said controller for transmitting and receiving acoustic signals.

4,620,286

PROBABILISTIC LEARNING ELEMENT

Allen R. Smith, Shelton; Chuan-Chieh Tan, Orange; Thomas B. Slack, Oxford, and Jeffrey N. Denenberg, Trumbull, all of Conn., assignors to ITT Corporation, New York, N.Y.

Filed Jan. 16, 1984, Ser. No. 571,027

Int. Cl.[4] G09C *00/00*; G06F *1/00*; G05B *15/08*

U.S. Cl. 364—513 **41 Claims**

1. A probabilistic learning element that sequentially receives objects and outputs sequences of recognized states, said learning element comprising:

means for sequentially receiving objects;

means for storing received object information, including,

said received objects, and

sequences of received objects;

means for storing items of previously learned information, said items including,

sequences of states,

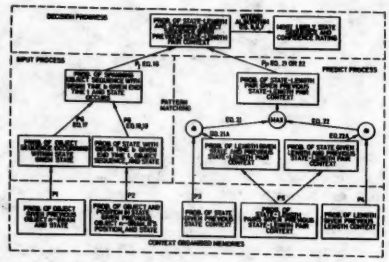
states contained in said sequences of states,

objects contained in said states contained in said sequences of states,

sequences of objects contained in said states contained in said sequences of states,

positional information for each object contained in said states contained in said sequences of states, and

predetermined types of knowledge relating to said previously learned information, whereby received object



information, relating to received objects, is stored as well as previously learned information;

means for correlating said received object information with said previously learned information for assigning conditional probabilities to possible sequencies of recognized states;

means, responsive to said conditional probabilities of possible sequences of recognized states, for determining a most likely sequence of recognized states;

means, responsive to said previously learned information, for detecting that a state has ended and for providing an end of state signal; and

means, responsive to said end-of-state signal, for outputting said most likely sequence of recognized states as a recognized state sequence.

4,620,287

METHOD AND APPARATUS FOR REPRESENTATION OF A CURVE OF UNIFORM WIDTH

David S. Yam, Eagan, Minn., assignor to Dicomed Corporation, Minneapolis, Minn.

Filed Jan. 20, 1983, Ser. No. 459,394

Int. Cl.[4] G06F *15/626*

U.S. Cl. 364—518 **13 Claims**

1. In a computer aided or generated graphics system, a method of graphical representation of a two dimensional form of uniform width on a display media, comprising the steps of;

providing a set of data points generally located along a longitudinal center line of the two dimensional form;

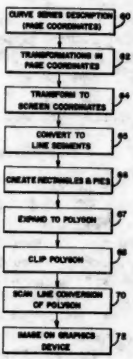
converting said data points to second sets of data for second or higher order parametric equations which define a plurality of adjoining curves that closely approximate said center line;

converting said second set of data to a plurality of line segments closely approximating each of said adjoining curves;

defining for each line segment four vertices of a rectangle having a predetermined uniform width, each of said rectangles being divided by its associated line segment into

two generally equal portions, said rectangles generally defining the two dimensional form;

smoothing the junction of said rectangles; and



recreating a graphic representation of said two dimensional form from the smooth rectangle data.

4,620,288

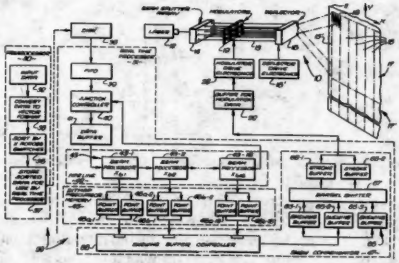
DATA HANDLING SYSTEM FOR A PATTERN GENERATOR

Thomas E. Welmers, Reseda, Calif., assignor to American Semiconductor Equipment Technologies, Woodland Hills, Calif.

Filed Oct. 26, 1983, Ser. No. 545,650

Int. Cl.[4] G06K *15/00*

U.S. Cl. 364—518 **24 Claims**



9. A data handling system for use with a laser or other pattern generator in which plural beams are swept across successive blocks of a target to form an image, said image comprising a plurality of polygons defined by certain input data provided to said system, comprising:

preprocessor means (a) for converting said polygon defining input data into a vector format in which each vector represents a portion of an edge of a polygon lying entirely within a swath defined by plural adjacent successive blocks of said target, each such vector including an initial start location of said edge portion, and end location of said edge portion, and a beam on/off direction control data, and (b) for sorting said vectors in accordance with the initial start locations thereof,

real time processor means, receiving said sorted vectors and including a bit map precursor memory having a storage location for each image element position in the sweep direction for each of said plural beams, for generating a bit map precursor in said memory in response to said vectors, the contents of each memory storage location thereby comprising a numeric value established by an algebraic combination of beam on/off direction control data for all vectors relating to edges crossing image positions associated with that storage location, and

bit map generation means for deriving from the contents of said bit map precursor memory a bit map of beam turn-on and turn-off control instructions for controlling each of said beams during the sweep of each block.

4,620,289

VIDEO DISPLAY SYSTEM

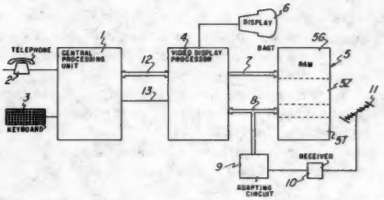
Gerard Chauvel, Cagnes, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Feb. 23, 1984, Ser. No. 583,074

Claims priority, application France, Apr. 25, 1983, 83 06741

Int. Cl.[4] G06F *3/153*; G06K *15/20*

U.S. Cl. 364—521 **9 Claims**



1. A control apparatus for a raster scan video display having a plurality of video display lines comprising:

a composite memory for storing data indicative of a video display including

a managing memory having a plurality of line composition data words, one line composition data word for each video display line, each line composition data word indicating the composition of the data for the corresponding video display line, and

a zone memory having a plurality of memory zones, one memory zone corresponding to each video display line, each memory zone including image data indicative of the image data having the corresponding video display line, said image data having the composition indicated by the corresponding line composition data word:

a central processing unit connected to said composite memory for controlling the composition of the video display by controlling the data stored in said managing memory and said zone memory:

a time base unit for generating time base signals in synchronization with the raster scan of the video display; and

a video display processor connected to said composite memory and said time base unit for generating at least one video display control signal for formation of the video display by recall of said line composition data word from said managing memory corresponding to the current video display line, recalling said image data from said zone memory corresponding to successive pixels of the current video display line and forming said at least one video control signal in accordance with said recalled image data for each pixel of the current video display line by interpreting said image data in accordance with said composition indicated by said recalled line composition data word.

4,620,290

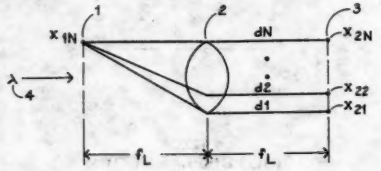
TRANSMISSION LINE DIVIDERS MULTIPLIERS FOURIER TRANSFORMERS AND CONVOLVERS

James Constant, 1603 Danbury Dr., Claremont, Calif. 91711

Continuation-in-part of Ser. No. 259,462, May 1, 1981, abandoned. This application Oct. 26, 1983, Ser. No. 545,514

Int. Cl.[4] G06G 9/00

U.S. Cl. 364—578 7 Claims



1. A system for computation of an integral such as a Fourier transform or convolution, including:

first means coupling signals as inputs to a transmission means; and

second means for coupling signals as outputs from said transmission means,

said transmission means including a plurality of transmission line each of which originates at a distinct location of said first means and terminates at a distinct location of said second means,

each transmission line having input signal f and providing output signal fg where g is a function determined by said transmission line, and

said second means providing as output the integral of fg for the plurality of said transmission lines.

4,620,291

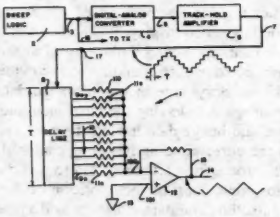
DIGITAL-TO-ANALOG CONVERTER INTERPOLATOR

Carl J. Vorst, St. Louis County, Mo., assignor to McDonnell Douglas Corporation, St. Louis, Mo.

Filed Feb. 6, 1984, Ser. No. 577,561

Int. Cl.[4] G06J 1/00; H03K 6/00, 4/08, 3/00

U.S. Cl. 364—607 13 Claims



1. A digital interpolator device, comprising:

means for generating an electrical signal representation of a digital ramp voltage;

digital-to-analog converter means operatively connected to an output side of said generating means, said digital-to-analog converter providing an analog stepped voltage form at its output side;

an analog delay line having an input side operatively connected to the output side of said digital-to-analog converter means, said analog delay line having a plurality of output taps;

means for summing the electrical signal representation at the output taps of said analog delay line;

means for selecting a sample period for said delay line operatively connected between said signal generating means and said output taps;

means for controlling the gain of said summing means operatively connected between an output side and an input side of said summing means; and

means for adjusting sweep rates operatively connected to said means for selecting a sample period for said delay line including a first read only memory means operatively connected between said sweep selecting means, and a voltage controlled oscillator operatively connected to said first read only memory and to said digital-to-analog converter.

4,620,292

ARITHMETIC LOGIC UNIT FOR FLOATING POINT DATA AND/OR FIXED POINT DATA

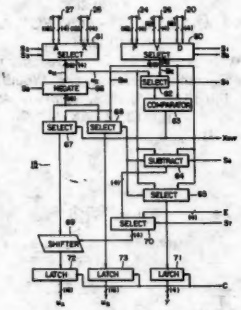
Yoshimune Hagiwara; Shizuo Sugiyama, both of Kodaira; Narimichi Maeda, Tachikawa; Osamu Yumoto, Kokobunji; Takashi Akazawa, Kodaira; Masahito Kobayashi, Yokohama; Yasuhiro Kita, Hachioji, and Yuzo Kita, Fuchu, all of Japan, assignors to Hitachi, Ltd. and Hitachi Denshi Kabusihiki Kaisha, both of Tokyo, Japan

Division of Ser. No. 311,680, Oct. 15, 1981, Pat. No. 4,511,990. This application Feb. 12, 1985, Ser. No. 700,908

Claims priority, application Japan, Oct. 31, 1980, 55-152051

Int. Cl.[4] G06F 7/50; H03M 7/24

U.S. Cl. 364—748 20 Claims



3. An arithmetic logic unit for floating point data and fixed point data, comprising:

first means for selectively providing a first pair of first and second floating point data which are to be mutually added, or a second pair consisting of third floating point data including a mantissa part into which fixed point data is provided and an exponent part having a value of zero and fourth floating point data including a mantissa part having a value of zero and an exponent part of a predetermined value;

adjusting means connected to said first means for adjusting the first or second pair of floating point data provided by said first means to provide for each data of the selected pair an exponent part having the same value and two adjusted mantissa parts;

adding means connected to said adjusting means for adding the two adjusted mantissa parts;

shifting means connected to said adding means for shifting the output of said adding means;

second means connected to said shifting means for controlling said shifting means to effect a shift by an amount depending on the output of said adding means, to normalize the output of said adding means; and

third means connected to said second means and said adjusting means for providing a normalized exponent by modifying the exponent part provided from said adjusting

means by an amount corresponding to said shift amount to normalize the exponent part of the sum of the data pair;

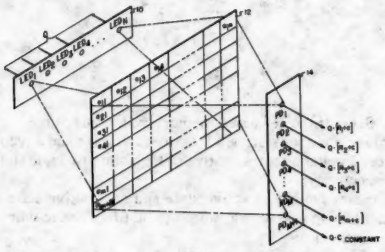
whereby said shifting means and said third means provide respectively a normalized mantissa part and a normalized exponent part of either the sum of the first pair of data or a floating point data corresponding to the fixed point data.

4,620,293

OPTICAL MATRIX MULTIPLIER

Richard S. Schlunt, Loma Linda; Hans-Peter Schmid, Rancho Cucamonga, and Donald R. Fetterly, Norco, all of Calif., assignors to General Dynamics, Pomona Division, Pomona, Calif.

Filed Dec. 23, 1983, Ser. No. 565,062
Int. Cl.[4] G06G *9/00*; G06F *7/56*
U.S. Cl. 364—845 **8 Claims**



1. An optical system for performing matrix manipulations, comprising:

a source means for producing a plurality of light beams to illuminate a plurality of locations, the intensity of each beam representative of a predetermined value in an N×1 column vector, Q;

an optically transmissive mask disposed to be illuminated by said source means and including a plurality of elements corresponding to said plurality of locations, said elements disposed in a two-dimensional mask matrix having M+1 rows and N columns, wherein each said element has information defined by its degree of optical transmittance, and each element in each row of M rows of said mask matrix is representative of the sum of a predetermined value in a known M×N matrix and a scalar constant, c, and each element of the remaining row of said mask matrix is representative of said scalar constant, c; and

photodetection means positioned to receive light transmitted through said mask for determining the intensity of light received at its position, and for providing one or more first signals representative of a function of said vector Q and said known matrix and a second signal representative of a function of said vector Q and said scalar constant, c.

4,620,294

DIGITAL SIGNAL PROCESSOR MODEM

Tommy Y. Leung, Cassopolis, Mich., and Mark A. Waldron, Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Sep. 9, 1983, Ser. No. 530,690
Int. Cl.[4] G06F *3/00*; H04L *5/12*
U.S. Cl. 364—900 **31 Claims**

1. A telephone network between an originate modem and an answer modem, at least one said modem comprising a two speed, full duplex modem for transmitting and receiving analog signals through said telephone network, said full duplex modem comprising:

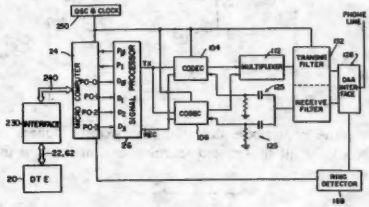
(a) a data terminal means for transmitting and receiving digital data;

(b) a microcomputer means in communication with the data terminal means;

(c) a signal processor means in communication with the microcomputer means, said signal processor means further providing a means for storing a plurality of digital data samples corresponding to a sinusoidal waveform;

(d) a converting means in communication with the signal processor means for converting digital data from the signal processor to the analog signal for transmission over the telephone network, and for converting the received analog signal from the telephone network to the digital data;

(e) a filter means in communication with the converting means and the telephone network for filtering the analog signal for transmission between the converting means and the telephone network, and for filtering the received analog signal; and



(f) a selecting means in communication with the microcomputer means for selecting a bit rate mode using the digital data from the data terminal means; said selecting means further providing a means responsive to the bit rate of the originate modem, to selectively communicate either a relatively higher bit rate by differential phase shift keying, or a relatively lower bit rate by frequency shift keying; the selecting means further providing a means for selecting digital data samples at intervals determined by the bit rate mode, to synthesize the digital data modulated for transmission through the converting means to the analog signal for transision through the filter means over the telephone network for communication between the originate modem and the answer modem.

4,620,295

METHOD FOR ACCESSING A DATA SET IN A WORD PROCESSING SYSTEM

John A. Aiken, Jr., Round Rock, Tex., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 6, 1984, Ser. No. 586,594
Claims priority, application Japan, Mar. 7, 1983, 58-36087
Int. Cl.[4] G06F *1/00*
U.S. Cl. 364—900 **7 Claims**

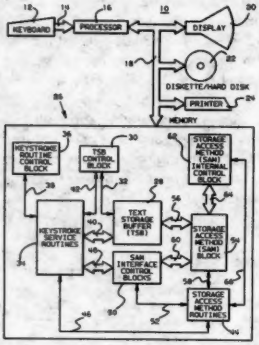
1. In a word processing system including a system memory and a direct access storage device (DASD) storing an input text stream where text may be selected later for revision, a method for accessing a data set in the word processing system comprising:

performing an open data set for access operation by first searching the current volume index on the DASD for a desired data set based on the data set name and a data set type;

fetching a data set root index node into an interface control block in the storage access control block section of system memory;

requiring the storage access control block to remain available at the same memory location for all subsequent ac-

cesses to the data set until a close data set operation is performed; and



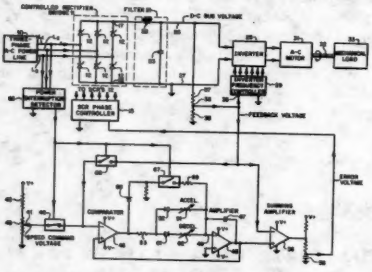
using the root node stored in the storage access control block for all subsequent searches and updates to the data set index.

4,620,296

PROTECTION SYSTEM FOR IMMUNIZING A CONTROLLED D-C POWER SUPPLY AGAINST A-C LINE VOLTAGE INTERRUPTIONS

Edward C. Siemon, Newfield, N.Y., assignor to Dana Corporation, Toledo, Ohio

Filed Nov. 29, 1984, Ser. No. 676,146
Int. Cl.[4] H02M *5/45*; H02H *7/122*
U.S. Cl. 363—51 **9 Claims**



1. A protection system for immunizing a controlled d-c power supply, which rectifies applied a-c power line voltage in a controlled rectifier bridge to develop a d-c bus voltage of a desired set point magnitude for driving a load, against the effects of unwanted a-c line voltage interruptions, the rectifier bridge being normally automatically controlled by control means in response to a command signal representing the set point magnitude and a feedback signal representing the d-c bus voltage's actual magnitude to normally maintain the d-c bus voltage at the desired magnitude, said protection system comprising:

sensing means for detecting an interruption of the a-c power line voltage;

said control means, controlled by said sensing means, controlling the rectifier bridge only in response to the feedback signal during the occurrence of a power interruption so that the rectifier bridge will initially produce a minimum amplitude d-c bus voltage when power is restored;

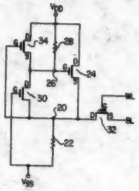
and acceleration regulating means, controlled by said sensing means, for gradually increasing the d-c bus voltage, at an adjustable rate, back up to the desired set point level after the power has been restored.

4,620,297

SCHMITT TRIGGER BASED MEMORY CELL WITH ASSISTED TURN ON

Theodore W. Houston, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1984, Ser. No. 646,871
Int. Cl.[4] G11C *11/34*
U.S. Cl. 365—174 **17 Claims**



1. A Schmitt trigger based memory cell, comprising:

a storage node for storing a first stored voltage and a second stored voltage representative of high and low logic states, respectively;

first means having an active state and an inactive state for maintaining said storage node at said first voltage when in the active state;

second means having an active state and an inactive state for switching said first means to the inactive state and maintaining said node at said second voltage when said second means is in the active state;

said second means changing states from inactive to active when the second voltage is forced on said node and from active to inactive when the first voltage is forced on said node;

said first means switching from inactive to active state in a predefined period of time when said second means switches states from active to inactive;

assist means for decreasing said predefined period of time, said assist means operable only during transition of said first means from the inactive to active state such that said assist means is inactivated during static operation of the memory cell; and

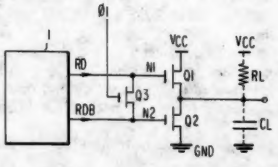
means for connecting an external source to said node to force an external high or low voltage thereof, removal of said forced high or low voltage allowing said storage node to remain at said first or second storage voltage without change.

4,620,298

HIGH-SPEED OUTPUT CIRCUIT

Takashi Ozawa, Tokyo, Japan, assignor to NEC, Tokyo, Japan

Filed Dec. 14, 1983, Ser. No. 561,368
Claims priority, application Japan, Dec. 14, 1982, 57-218687
Int. Cl.[4] G11C *11/40*
U.S. Cl. 365—189 **9 Claims**



1. An output circuit comprising a first voltage terminal receiving one of potentials of binary logic levels, a second

voltage terminal receiving the other of potentials of said binary logic levels, a series circuit of first and second field effect transistors connected between said first and second voltage terminals, an output terminal coupled to an intermediate junction of said series circuit, data means for operatively generating a first signal and a second signal having an opposite phase to said first signal, means for applying said first signal to a gate of said first transistor, means for applying said second signal to a gate of said second transistor, short-circuit means directly coupled between the gates of said first and second transistors for operatively providing a current path between the gates of said first and second transistor, thereby to make potentials of the gates of said first and second transistors substantially equal each other, and control means for enabling said short-circuit means before said data means produces a renewed state of said first and second signals.

4,620,299

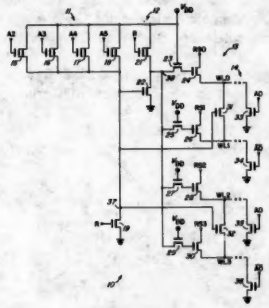
ROW DECODER

Scott Remington, and William L. Martino, Jr., both of Austin, Tex., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 4, 1985, Ser. No. 709,262

Int. Cl.[4] G11C *8/00, 7/02*

U.S. Cl. 365—230 **12 Claims**



1. A row decoder, having an active cycle and an inactive cycle, for enabling at least one of a plurality of word lines when selected, comprising:

an OR decoder having an input for receiving a plurality of address signals, and an output for providing an output signal at a first logic state when the OR decoder is selected by the address signals and at a second logic state when the OR decoder is deselected by the address signals;

word line driver means, coupled to the output of the OR decoder and to the plurality of word lines, for receiving a plurality of decoded address signals and for coupling said decoded address signals to respective word lines when the OR decoder is selected;

first coupling means, coupled to first and second word lines of the plurality of word lines, for coupling one of the first and second word lines to a first reference terminal during the active cycle; and

a first coupling transistor having a first current electrode coupled to the first word line, a second current electrode coupled to the second word line, and a control electrode coupled to the output of the OR decoder.

4,620,300

DIGITAL SIGNAL DETECTING AND COMPENSATING CIRCUIT WITH ADJUSTABLE WINDOW SIGNAL

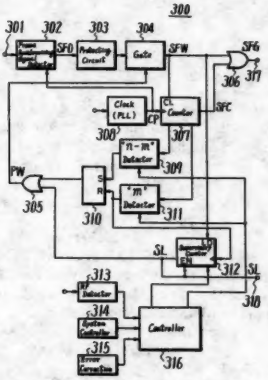
Hiroshi Ogawa, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 443,902, Nov. 23, 1982, abandoned. This application Oct. 3, 1985, Ser. No. 784,699

Claims priority, application Japan, Dec. 8, 1981, 56-197189; Dec. 10, 1981, 56-198814

Int. Cl.[4] G11B *7/00, 19/00, 19/28*

U.S. Cl. 369—33 **17 Claims**



1. In a detecting and compensating circuit of an apparatus for reproducing a digital signal separated by frame synchronizing signals, each having a predetermined frame period, the combination comprising:

detecting means for detecting said frame synchronizing signals and generating respective detection signals in response thereto;

gating means receiving said detection signals for gating the latter in response to gating signals; and

windowing means including first means for supplying first window signals of a first predetermined length synchronized with said detection signals as said gating signals to said gating means, and second means for supplying second window signals of a second predetermined length as said gating signals to said gating means when a plurality of said detection signals are not generated, said second predetermined length being greater than said first predetermined length.

4,620,301

RECORDING DISK DRIVE UNIT

Hiroshi Koide, Kanagawa, Japan, assignor to Ricoh Company, Ltd., Japan

Filed Dec. 19, 1983, Ser. No. 562,717

Claims priority, application Japan, Dec. 20, 1982, 57-223306; Jan. 13, 1983, 58-3942

Int. Cl.[4] H02K *29/00;* **G11B** *17/00, 5/82*

U.S. Cl. 369—266 **8 Claims**

1. A recording disk drive unit comprising:

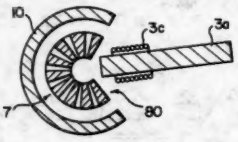
(a) a turntable for placing a recording disk thereon;

(b) a drive motor for rotating said turntable about its own axis;

(c) a head for recording information on and retrieving information from the recording disk on said turntable;

(d) a radial feed unit for moving said head radially across the recording disk on said turntable to allow said head to record information on and retrieve information from the recording disk while said turntable is being rotated by said motor; and

(e) said drive motor comprising a shaft supporting said turntable, a rotor mounted coaxially on said shaft, a first C-shaped stator disposed in spaced and confronting relation to said rotor for generating a moving magnetic field, and a second stator disposed in confronting relation to said first stator with said rotor positioned therebetween;



wherein said first C-shaped stator has a radial recess, said radial feed unit having one end inserted in said recess, said stator having a plurality of teeth extending axially of said shaft.

4,620,302

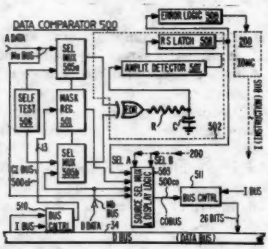
PROGRAMMABLE DIGITAL SIGNAL TESTING SYSTEM

Peter P. Binoeder, Tustin; James B. Whitacre, Westminster, and Don Kunker, San Juan Capistrano, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Filed Jan. 6, 1984, Ser. No. 568,834

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—1 **3 Claims**



1. Testing and diagnosing apparatus for a digital unit comprising:

(a) a standard unit to which it is desired that said digital unit conform, and including:

(a1) pairs of output lines, each pair consisting of one output from said standard unit and one analogous output from said digital unit;

(b) a host computer having generating means for generating a testing signal comprised of a plurality of sequentially occurring different digital signal patterns and for concurrently applying said testing signal to said digital unit and to said standard unit;

(c) analyzing means for continuously comparing the outputs of said digital unit and said standard unit and for producing a failure signal in response to the determination that a predetermined comparison failure has occurred between said outputs; and wherein said analyzing means includes;

(c1) a skew analyzer to which the said output pairs of said digital unit and said standard unit are continuously applied, said skew analyzer being operative to produce said failure signal in response to the particular output pairs of said digital and standard units being out of skew for a time greater than a predetermined minimum time period, said skew analyzer including:

(c1a) a plurality of skew comparison circuits providing a discrete skew comparison circuit for each pair of said output lines;

(d) self-test generating means, initiated by a maintenance processor means, for generating pairs of digital output signls in two test modes for transmittal, via a select multiplexor means, to said analyzing means, said self-test generating means including:

(d1) first means to generate a pair of digital first self-test output signals having a skew less than said predetermined minimum time period;

(d2) second means to generate a pair of digital second self-test output signals having a skew greater than said predetermined minimum time period;

(e) select multiplexor means for receiving said pairs of output lines of said digital unit and said standard unit, and for receiving said first and second self-test output signals, said select multiplexor means being controlled by said maintenance processor means to select said pairs of output lines of said digital and standard units, or said first and second self-test output signals for transmittal to said analyzing means;

(f) said maintenance processor means for controlling said select multiplexor means and said self-test generating means, and including:

(f1) means to receive said failure signal from said analyzing means, and to identify the particular comparison circuit of said skew analyzer which caused said failure signal.

4,620,303

CIRCUIT ARRANGEMENT FOR THE RECOGNITION OF STATIC AND DYNAMIC FAULTS IN CIRCUIT ASSEMBLIES

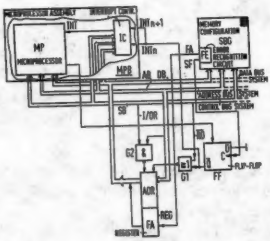
Norbert Tschoepe, Munich, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Aug. 24, 1984, Ser. No. 644,074

Claims priority, application Fed. Rep. of Germany, Sep. 9, 1983, 3332626

Int. Cl.[4] G06F *11/00*

U.S. Cl. 371—16 **2 Claims**



1. In a circuit arrangement for the recognition of faults occurring in circuit assemblies, the faults being indicated by these circuit assemblies in each case by the emission of a fault signal, which faults detected by a detector means may be either static faults persisting for more than a predetermined first time period or dynamic faults which do not exceed a predetermined second time period, the fault signals being recognized at a central control unit, which central control unit is connected to these circuit assemblies and drives them for the emission of data signals including the fault signals,

the improvement wherein the said central control unit has a first interrupt input that the central control unit activates when the circuit assemblies are in a fault-free state in which a fault recognition circuit emits no fault signal and a second interrupt input, having a higher interrupt priority than the first interrupt input, which the central control

unit deactivates when the circuit assemblies are in the said fault-free state;

a register is provided, into which register, when the circuit assemblies are driven to emit the data signals, address information with regard to the just driven circuit assembly by the central control unit is written;

at least one such fault recognition circuit is provided, which, when a fault exists in a respective circuit assembly, emits a fault signal when that circuit assembly is driven; and

a control device is connected to the first and second interrupt inputs of the central control unit, which, in response to such a fault signal, effects, through the first interrupt input, the performance of a first interrupt routine in the central control unit, which first interrupt routine serves to determine the presence of dynamic faults, in the course of which first interrupt routine, the central control unit activates the second interrupt input and again drives the circuit assembly designated by the address stored in the said register,

and the control device effects, in the event that the said fault recognition circuit again emits a fault signal, the performance of a second interrupt routine, which serves to determine the presence of static faults and interrupts the performance of the said first interrupt routine.

4,620,304

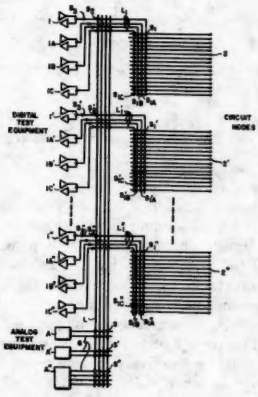
METHOD OF AND APPARATUS FOR MULTIPLEXED AUTOMATIC TESTING OF ELECTRONIC CIRCUITS AND THE LIKE

James J. Faran, Jr., Lincoln; Matthew L. Fichtenbaum, Chelmsford, and William C. Kabele, Littleton, all of Mass., assignors to Gen Rad, Inc., Concord, Mass.

Continuation of Ser. No. 417,215, Sep. 13, 1982, abandoned. This application Mar. 13, 1985, Ser. No. 710,535

Int. Cl.⁴ G01R *31/28*

U.S. Cl. 371—20 **18 Claims**



1. A method of performing a test on electronic circuits and the like comprising a relatively large number of nodes, that comprises, assigning each node to a connection point in a group of connection points connectable at any given time with only a predetermined number of signal lines connectable with test equipment, the predetermined number of signal lines being less than the number of connection points in the group; controlling said assigning of the nodes of specific connection points in a manner that insures that no more sets of nodes, used simultaneously in any test, are assigned to the same group of connection points than there are signal lines connectable to that group of connection points, wherein, at a given time, a set of nodes is defined as a set consisting of all the nodes in a group that are logically capable, according to the predetermined test, of being driven or sensed by a common instrument at that given time; and selectively connecting the connection points to the test equipment to connect the test equipment to the nodes for conducting desired testing.

4,620,305

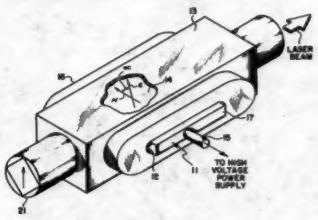
GAS LASER AND METHOD OF OPERATION

Allen M. Flusberg, Newtown, Mass., assignor to Avco Everett Research Laboratory, Inc., Everett, Mass.

Filed Sep. 17, 1984, Ser. No. 651,108

Int. Cl.⁴ H01S *3/00*

U.S. Cl. 372—37 **15 Claims**



1. In the method of operating a laser device having a lasing cavity having an optical axis and a gseous lasing medium having an upper lasing level disposed in said lasing cavity, the steps comprising:

(a) pumping said lasing medium therein to produce population inversion and stimulated emission in the saturated regime wherein the rate of stimulated emission is at least not substantially less than the sum of all other rates at which population is transferred out of said upper lasing level;

(b) causing the rate of collisions of lasing atoms and molecules occuring in said lasing medium during pumping to occur less rapidly than the sum of all the rates at which population is transferred out of said upper lasing level;

(c) generating within said cavity a DC magnetic field having an axis having a first predetermined orientation at least a component of which is transverse to the optical axis and of amplitude sufficient to induce an electron precession rate large compared to the said transition rate out of said upper lasing level; and

(d) polarizing laser light generated in said cavity to cause said light to have a predominate polarization orientated with respect to the axis of said magnetic field at angle of at least about 55° and less than 90°.

4,620,306

ELONGATED CHAMBERS FOR USE IN COMBINATION WITH A TRANSVERSELY EXCITED GAS LASER

Leroy V. Sutter, Jr., 6301 Summertime La., Culver City, Calif. 90230

Division of Ser. No. 403,781, Jul. 30, 1982, Pat. No. 4,464,760, which is a continuation-in-part of Ser. No. 370,103, Apr. 20, 1982, Pat. No. 4,455,658. This application Jul. 24, 1984, Ser. No. 633,855

The portion of the term of this patent subsequent to Aug. 7, 2001, has been disclaimed.

Int. Cl.⁴ H01S *3/09*

U.S. Cl. 372—38 **4 Claims**

1. A gas laser comprising:

a. an elongated chamber of cross-sectional dimensions suitable for confining a laser gas discharge, said elongated chamber being formed from a dielectric material;

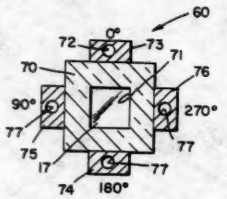
b. a laser gas disposed in said elongated chamber;

c. first and second reflecting means for reflecting and guiding light energy from said laser gas discharge within said elongated chamber so that said light energy is optically

independent of the internal walls of said elongated chamber as said light energy travels longitudinally the length of said elongated chamber; and

d. first and second electrode means for transversely exciting said laser gas, each of said electrode means being formed from an electrically conductive material and being disposed opposing each other wherein said first and second electrode means are disposed longitudinally on said elongated chamber;

e. third and fourth electrode means for transversely exciting said laser gas, each of said electrode means being formed from an electrically conductive material and being disposed opposing each other wherein said third and fourth electrode means are disposed longitudinally on said elongated chamber and are disposed orthogonally to said first and second electrode means;



f. energy means for applying a voltage of alternating polarity to said first and second electrode means and said third and fourth electrode means at a frequency ranging from 10 Mhz to about 3 GHz to establish a laser gas discharge in said laser gas; and

g. coupling means for matching the impedance of said elongated chamber and said first and second electrode means and said third and fourth electrode means to the impedance of said energy means.

4,620,307

SEMICONDUCTOR DIODE LASER

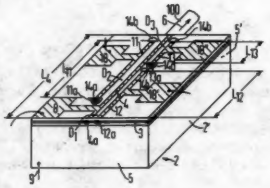
Franz Kappeler, Puchheim, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 2, 1985, Ser. No. 688,379

Claims priority, application Fed. Rep. of Germany, Jan. 13, 1984, 3401102; Aug. 24, 1984, 3431228; Feb. 5, 1985, application European Pat. Off., 84113494.3

Int. Cl.[4] H01S *3/19*

U.S. Cl. 372—50 **13 Claims**



1. A semiconductor diode laser for tunable single-frequency laser radiation, comprising:

a semiconductor body having first and second end faces, the laser radiation to be emitted being coupled out at the first end face;

a plurality of laser-active strips on a semiconductor body and having associated respective optical resonators;

said strips being aligned parallel to one another over an entire coupling length therebetween and at an interval from one another such that lateral wave-optical coupling is provided between neighboring strips;

a given selected spacing and a given selected coupling length between neighboring strips being chosen so as to provide a given coupling;

one of said laser-active strips being designated as an emitting laser-active strip generating laser radiation;

the further laser-active strips being provided at both sides of said emitting laser-active strip and being shorter than said emitting laser-active strips; and

said further laser-active strips being provided in said semiconductor body such that corresponding resonators of each further strip are provided with mirrors at both ends thereof and a first end of the further laser-active strips terminating a distance in front of said first end face of the semiconductor body through which the laser radiation to be emitted is coupled out.

4,620,308

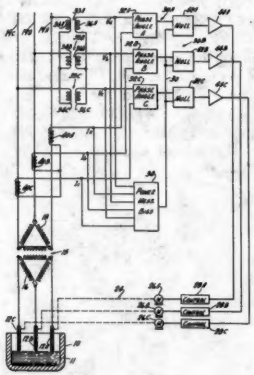
ARC FURNACE ELECTRODE CONTROL

John A. Persson, Gibsonia; Ross E. Andrews, Bethel Park, and Michael A. Maola, Pittsburgh, all of Pa., assignors to Lectromelt Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1985, Ser. No. 792,782

Int. Cl.[4] H05B *7/148*

U.S. Cl. 373—105 **10 Claims**



1. A control for positioning the electrodes of a poly-phase electric arc furnace energized by a poly-phase transformer having primary and secondary windings, and including control means for individually elevating and lowering each of the electrodes, the improvement comprising:

a plurality of first circuit means each coupled respectively to one of the primary phases of the transformer and each being operable respectively to generate a first electrical output signals functionally related to the phase angles between the voltage and current in each phase of the transformer primary,

bias circuit means coupled to each of the phases of the transformer primary for producing an additional output signal functionally related to the reactive volt amperes delivered to the transformer primary,

comparison means coupled to said first circuit means and said bias circuit means for respectively comparing the additional signal and each of said first signals to a preselected value and for producing a plurality of control signals related to differences in said signals,

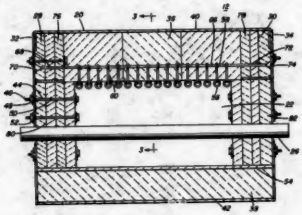
said control means coupled to said comparison means and being responsive to said control signals for selectively positioning each electrode whereby each electrode will be positioned in accordance with deviations in the phase angle in its respective primary circuit.

4,620,309

ELECTRIC FURNACE CONSTRUCTION

Stephen J. Schultz; John F. Huebner; Duane E. Wiedor, and Dennis S. Pribish, all of Pittsburgh, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 29, 1985, Ser. No. 717,939
Int. Cl.[4] F27D *11/02*
U.S. Cl. 373—128 12 Claims



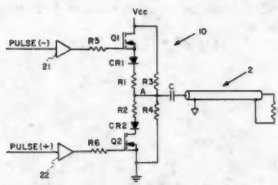
1. A furnace comprising:
opposing first and second sidewalls;
first and second structurally rigid insulating board attached to the interior of said furnace at said first and second sidewalls;
a roof;
roof insulating means;
at least one elongated rod passing through said roof insulating means and spanning the width of said furnace, said rod having a first and second end embedded within said first and second insulating board, respectively;
heating elements positioned within said furnace; and,
means to support said heating elements from said rod.

4,620,310

METHOD AND APPARATUS FOR GENERATING BIPOLAR PULSES IN A LOCAL AREA NETWORK

Lazar Lvovsky, Walnut Creek, and V. Bruce Hunt, Menlo Park, both of Calif., assignors to Metapath Inc., Foster City, Calif.

Filed Mar. 11, 1985, Ser. No. 710,491
Int. Cl.[4] H03L *3/18;* H04B *25/49*
U.S. Cl. 375—17 15 Claims



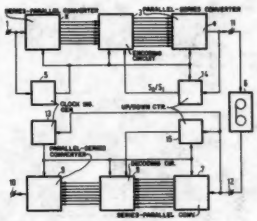
1. A pulse transmitter comprising:
a first switch means which is switchable between a conducting state and a non-conducting state and having a first electrode coupled to a source of potential;
a second electrode coupled to a node through a first resistor having a first resistance;
means responsive to a control signal for switching said first switch means between said conducting and non-conducting states;
a second switch means which is switchable between a conducting state and a non-conducting state and having a first electrode coupled to said node through a second resistor having a second resistance;
a second electrode coupled to a reference potential; and
means responsive to a control signal for switching said second switch means between said conducting and non-conducting states;
a third resistor having a third resistance coupled between said source of potential and said node;
a fourth resistor having a fourth resistance coupled between said node and said reference potential, the magnitude of each of said third and said fourth resistances being substantially greater than the magnitude of each of said first and said second resistances; and
a capacitor having a first electrode coupled to said node and a second electrode for coupling to a transmission line.

4,620,311

METHOD OF TRANSMITTING INFORMATION, ENCODING DEVICE FOR USE IN THE METHOD, AND DECODING DEVICE FOR USE IN THE METHOD

Kornelis A. Schouhamer Immink, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 676,467, Nov. 29, 1984, Pat. No. 4,573,034.
This application Dec. 7, 1984, Ser. No. 679,171
Claims priority, application Netherlands, Jan. 20, 1984, 8400187; Aug. 8, 1984, 8402444
Int. Cl.[4] H04L *25/49;* H03M *7/14*
U.S. Cl. 375—19 7 Claims



6. An encoding device for converting n-bit information words into m-bit code words with a limited maximum disparity ±d prior to transmission, where n, m and d are integers which comply with $<m$ and $d <m$, in such a way that a digital-sum-vaue taken over all the preceding code words at the beginning of a code word remains limited to a range which is bounded by a first and a second value, in which the following code word is selected, at least with respect to the polarity of the disparity, as a function of said digital-sum-value over all the preceding code words so as to ensure that said following code word cannot cause an increase of the absolute value of said digital-sum-value, for which purpose a pair of code words is assigned to at least a first group of possible n-bit information words, the code words of said pair having opposite disparities with an absolute value d and being the bit-by-bit inverse of one another for each associated information word, characterized in that said encoding device comprises means for determining the digital-sum-value taken over all the preceding words; means for converting the information words of the first group; and means for inverting and reversing the code words obtained by converting information words of the first group if this is required by the digital-sum-value thus determined.

4,620,312

PULSE SIGNAL PROCESSING CIRCUIT

Noriyuki Yamashita, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Continuation of Ser. No. 515,187, Jul. 19, 1983, abandoned. This application Dec. 3, 1985, Ser. No. 804,238
Claims priority, application Japan, Jul. 20, 1982, 57-125985
Int. Cl.[4] H03K *3/033*
U.S. Cl. 375—22 8 Claims

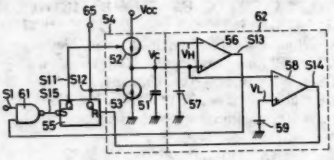
6. A video image processing system comprising:
gate means for accepting periodic input pulses and a first detection signal and providing a setting signal in response to the presence of both, said gage means masking noise in

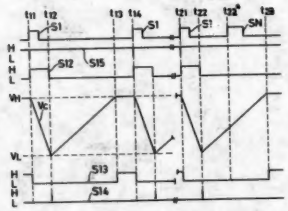
said periodic input pulses in response to said first detection signal;

a switching circuit for selectively providing charging and discharging signals in response to said setting signal and a second detection signal, one of said charging and discharging signals constituting an output pulse;

a capacitor for providing a variable-level indicating signal from the potential across said capacitor;

charging means for increasing the potential across said capacitor in response to said charging signal;





discharging means for decreasing the potential across said capacitor in response to said discharging signal; and

detecting means for providing said first and second detection signals when the potential across said capacitor reaches predetermined reference potentials, whereby the duration of the output pulse is determined by the time required for the potential of said capacitor to reach one reference potentials from the other.

4,620,313

CONTROLLED CUTOFF FREQUENCY ANALOG FILTER FOR CT SCANNERS

Joseph W. Erker, Aurora, Ohio, assignor to Technicare Corporation, Solon, Ohio

Filed Jun. 20, 1984, Ser. No. 622,522

Int. Cl.[4] G03B *41/16*

U.S. Cl. 378—19 **5 Claims**

1. An X-ray computed tomographic scanner for reconstructing an image of a region of an object positioned in a scan circle from filtered data sampled at a preselected frequency comprising:

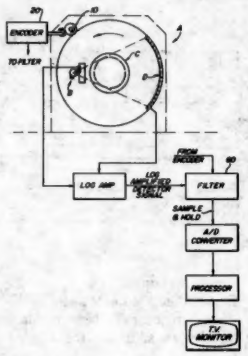
(a) a source of X-radiaiton rotating at an angular velocity about said scan circle for radiating the scan circle with a beam of radiation of preselected intensity from a plurality of directions;

(b) an array of radiation detectors disposed about the scan circle positioned to receive transmitted radiation emitted by said source and having traversed the scan circle and to convert said received radiation into signals proportional to their intensity, said signals having a temporal frequency content functionally related to the angular velocity of the source;

(c) position indicating means operatively connected to said rotating source for detecting the angular velocity of said source;

(d) data acquisition means for collecting the converted signals from said radiation detectors, said signals generally having a high frequency component and wide band quantum noise which contribute to degradation of reconstructed images;

(e) active analog filter means responsive to said position indicating means having a variable cutoff frequency automatically set as a predetermined fraction of the detected



angular velocity of said source such that the frequency content of the filtered collected data essentially contains no frequencies above ½ the data sampling frequency;

(f) sampling means for sampling the filtered data at a preselected frequency; and (g) means for reconstructing an image of the scanned region of the object from the sampled data.

4,620,314

METHOD OF GENERATING AN APPROXIMATELY SINUSOIDAL SIGNAL AND CIRCUIT ARRANGEMENT FOR IMPLEMENTING THIS METHOD, PARTICULARLY IN A STEREO DEMODULATOR

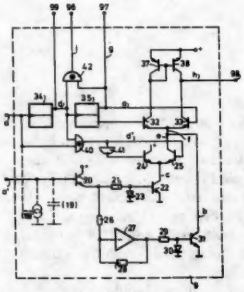
Winfried Jansen, Hasloh, and Wolfgang Nolde, Hamburg, both of Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 23, 1984, Ser. No. 592,663

Claims priority, application Fed. Rep. of Germany, Mar. 26, 1983, 3311072

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—4 **15 Claims**



1. Method for generating an approximately sinusoidal signal having a predetermined period, comprising the steps of:

generating a first signal having a first signal period equal to one-half of said predetermined period, said first signal comprising a triangular wave shape extending over one-

half of each of said first signal period and a constant value during the remainder of said first signal period;

superimposing a second triangular signal onto said first signal, thereby generating a combined signal; and

inverting alternate half waves of said combined signal, thereby creating said approximately sinusoidal signal.

4,620,315

AUTOMATIC FREQUENCY CONTROL CIRCUIT IN A STEREO FM RADIO RECEIVER

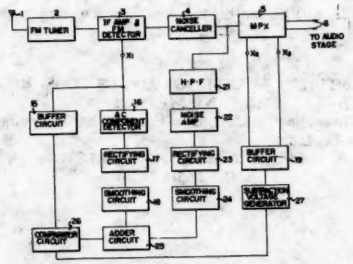
Toshiyuki Imagawa, Tokyo, Japan, assignor to Clarion Co., Ltd., Tokyo, Japan

Filed Feb. 5, 1985, Ser. No. 698,307

Claims priority, application Japan, Feb. 9, 1984, 59-23749

Int. Cl.[4] H04H *5/00*

U.S. Cl. 381—10 **3 Claims**



1. An automatic frequency control circuit in an FM stereophonic radio receiver which includes at least an FM tuner; an intermediate frequency amplifying and detecting circuit responsive to said FM tuner having an output terminal for supply of a voltage for driving a signal meter; a noise canceller responsive to said amplifying and detecting circuit; and a multiplexer responsive to said noise canceller having an input terminal for entering a voltage for high-cut control and another input terminal for entering a voltage for stereo noise control, said automatic frequency control circuit comprising:

first means extracting, rectifying and smoothing ac components in said signal meter driving voltage;

second means extracting, rectifying and smoothing noise components in an output from said noise canceller;

third means summing output voltages from said first and second means;

fourth means extracting dc components in said signal meter driving voltage and comparing them with the sum voltage from said third means;

fifth means responsive to an output from said forth means to generate an output voltage corresponding to the difference between said dc components and said sum voltage; and

sixth means applying an output from said fifth means to said input terminals of said multiplexer.

4,620,316

SPEECH RECOGNITION SYSTEM

Toshikazu Yasue, Akishima; Michihiro Mese, Tokyo, and Takeyuki Endo, Kodaira, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 384,601, Jun. 3, 1982, abandoned. This application Nov. 19, 1985, Ser. No. 799,482

Claims priority, application Japan, Jun. 5, 1981, 56-85717

Int. Cl.[4] G10L *5/00*

U.S. Cl. 381—43 **11 Claims**

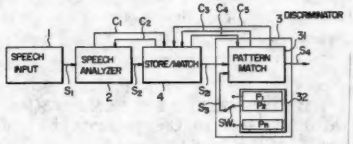
1. A speech recognition system comprising:

(a) first means for inputting speech signals;

(b) analyzer means connected to said first means for analyzing the inputted speech signals to produce analysis data;

(c) speech discriminator means connected to receive said analysis data for comparing said analysis data with standard patterns of speech so as to recognize the input speech signals; and

(d) second means for receiving and storing the analysis data from said analyzer means and for supplying the stored analysis data to said speech discriminator means, including write-addressing means for generating write address signals and read-addressing means for generating read address signals, and memory means for storing said analysis data from said analyzer means sequentially under control of said write-addressing means and for reading out said analysis data to said speech discriminator means in a predetermined sequence under control of said read-addressing means in parallel with the storing of said analysis data and independently of the operation of said write-addressing means.



4,620,317

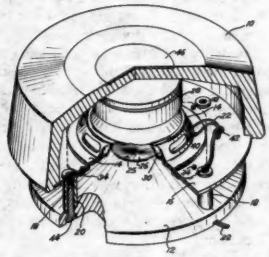
TABLETOP SPEAKER ASSEMBLY

Carl R. Anderson, Wilmette, Ill., assignor to Shure Brothers, Inc., Evanston, Ill.

Filed Apr. 5, 1984, Ser. No. 597,249

Int. Cl.[4] H04R *1/28, 1/02, 1/32*

U.S. Cl. 381—90 **2 Claims**



1. A tabletop speaker assembly for a teleconferencing system or the like, the speaker assembly being of the kind adapted to rest on a generally flat surface, comprising, in combination:

a base for supporting the assembly, the base having a generally conical configuration with a peak and a bottom, and having one or more acoustically reflective surfaces angled from the peak to the bottom of the base to form an approximate 20 degree angle relative to the generally flat surface on which the assembly rests;

a support plate affixed to the base;

a speaker having a speaker cone and a rear portion opposite the speaker cone, with the speaker supported by the plate above the base with the speaker further positioned to direct sound downward toward the base's acoustically reflective surfaces;

a cover having an interior height also supported by the plate and surrounding the speaker's rear, the assembly being configured with the rear of the speaker positioned very close to the inside of the cover, the height of the interior of the cover being approximately the same as the height of the speaker, the speaker cone being positioned approximately $\frac{1}{4}$ inch or less from the base's peak, and the cover

extending near the base such that the sound exits from the assembly near the base, and further configured with the portion of the base closest to the speaker cone being concave away from the speaker, the concave portion of the base being configured as an inverted cone concentric with the conical base and extending into the base a distance approximately equal to one-third of the height of the base; and

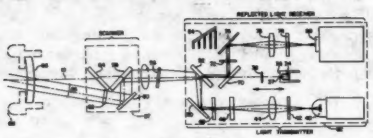
a plurality of bushings received in openings in the base, the plate being supported by the bushings, and with at least one bushing being hollow to allow a cable to pass into the assembly.

4,620,318

FOVEA-CENTERED EYE FUNDUS SCANNER

Robert B. Hill, Portland, Oreg., assignor to EYE-D Development II Ltd., Portland, Oreg.

Filed Apr. 18, 1983, Ser. No. 486,014
Int. Cl.[4] G06K *9/00*; A61B *3/10*
U.S. Cl. 382—2 **7 Claims**



1. Apparatus for identifying individuals through the ocular light reflection pattern from the fundus of the eye, comprising:

(a) fixation means providing a fixation beam of visible light for positioning and focusing the eye of an individual along its visual axis, said axis being centered on the fovea,

(b) source means providing a source beam of infrared radiation,

(c) scanner means positioned for receiving the source beam and for directing it into the fixated eye from a plurality of sequential angularly divergent positions, in order to form a substantially circular locus of points substantially centered on the fovea, the source beam being directed along the visual axis into the scanner means, the scanner means comprising a housing rotatable about the visual axis, a first mirror mounted in the housing for reflecting the source beam of axis, and a second mirror mounted in the housing at a point spaced from the axis and oriented to direct the source beam into the eye as the housing rotates, and

(d) receiver means positioned for detecting the intensity of the light radiation reflected from the eye at each sequential location.

4,620,319

COLLAPSIBLE CONTAINER FRAME

Joseph C. M. Sheehan, Burr Ridge, and Bruce P. Dorr, Westmont, both of Ill., assignors to Kells Medical, Inc., Burr Ridge, Ill.

Filed Mar. 8, 1985, Ser. No. 709,544
Int. Cl.[4] B65D *33/00*; B65B *67/04*
U.S. Cl. 383—33 **17 Claims**

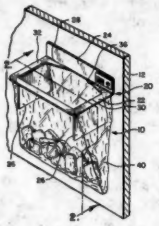
14. A collapsible container comprising:

a thin sheet of material comprising a frame portion, a mounting portion, and two tab portions, said mounting portion hinged to the frame portion at a first fold line and said tab portions hinged to the frame portion at third and fourth fold lines, respectively, said frame portion defining an opening, said second and third fold lines extending generally transverse to the first fold line, said tab portions at least partially blocking the opening when in a first position;

a flexible bag bonded to the frame portion such that the opening provides access to the bag; and

an adhesive secured to the mounting portion;

said adhesive adapted to mount the mounting portion to a vertical surface, said tab portions shaped to fold down, into the bag, to bear against the vertical surface, thereby



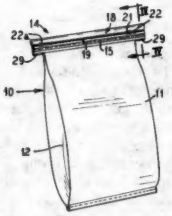
simultaneously holding the frame portion away from the vertical surface and holding the bag open.

4,620,320

SUBSTANTIALLY LEAKPROOF ZIPPER CLOSURE FOR BAGS AND METHOD

Brian Sullivan, Shelbyville, Ind., assignor to KCL Corporation, Shelbyville, Ind.

Filed Dec. 20, 1984, Ser. No. 684,291
Int. Cl.[4] B65D *33/16*
U.S. Cl. 383—79 **12 Claims**



1. A bag including a collapsed tubular body with a top providing an opening extending from side-to-side of the bag, and comprising:

a hood-like top closure secured to said bag body over said opening and having end portions extending to a substantial distance beyond opposite sides of the bag body;

means closing said end portions against leakage;

said top closure having a zipper separably connecting a pair of attachment flanges one of which extends along and is secured to one face of the bag top along said opening and the other of which flanges is secured to a second face of the bag top along said opening; and

said means closing said end portions against leakage comprising adhesive bonding said flanges in said end portions.

4,620,321

OPTICAL FIBRE RECEIVER

David P. M. Chown, Great Dunmow, England, assignor to STC plc, London, England

Filed May 15, 1984, Ser. No. 610,487
Claims priority, application United Kingdom, May 19, 1983, 8313855
Int. Cl.[4] H04B *9/00*
U.S. Cl. 455—619 **6 Claims**

1. An optical receiver for the reception of a modulated light beam, said receiver comprising:

a p-i-n diode on to which the modulated light beam is directed to produce therein an electrical current appropriate to the modulation;

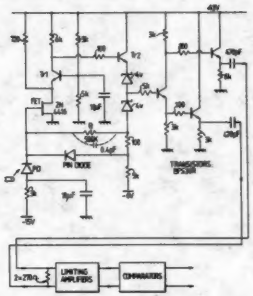
an amplifier which includes a field effect transistor having a gate to which the p-i-n diode is connected, a second transistor whose emitter-collector path is in series with the source-drain path of the field effect transistor, and a third transistor, the output of the second transistor being coupled to the base of the third transistor;

a feedback connection from the output of the third transistor to the gate of the field-effect transistor, said feedback connection including the parallel-connected combination of a resistive load impedance and a non-linear diode, which diode is so poled and has parameters such that it acts as a dynamic load to prevent saturation of the amplifier under high input signal conditions, the parameters of the resistor and the diode being such that the receiver including the said amplifier has a low pass response with a relatively long time constant, e.g. in the range of 160 to 180 ns;

the output of the third transistor being coupled to the output of the amplifier; and

circuit elements which couple the amplifier output to a utilisation circuit and which provide for said amplifier output an alternating current coupling response which has a relatively short time constant, e.g. in the range of 100–400 ns;

wherein the combination of the said low pass response with the said alternating current coupling response ensures that the receiver has an overall relatively narrow bandwidth response, such that the receiver's overall response is not



reduced significantly after the reception of a high amplitude signal.

DESIGN PATENTS

GRANTED OCT. 28, 1986

ERRATA

For CLASS	See PATENT NO.
D25–001	286,431
D25–019	286,432
D25–050	286,433
D25–052	286,434

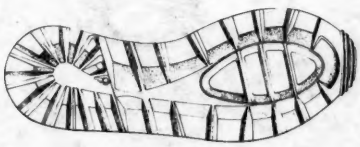
DESIGNS

OCTOBER 28, 1986

286,340
FROZEN CONFECTION
Anthony S. Torpy, Mosman, Australia, assignor to Thomas J. Lipton, Inc., Englewood Cliffs, N.J.
Filed Mar. 8, 1984, Ser. No. 587,408
Term of patent 14 years
U.S. Cl. D1—102

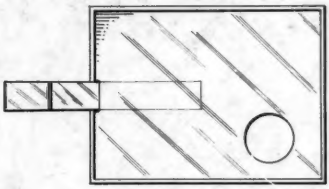
286,341
ARM WARMER GARMENT
Euseibio Manzano, Jr., 345 E. Kamala St., Oxnard, Calif. 93033
Filed Nov. 23, 1983, Ser. No. 554,528
Term of patent 14 years
U.S. Cl. D2—25

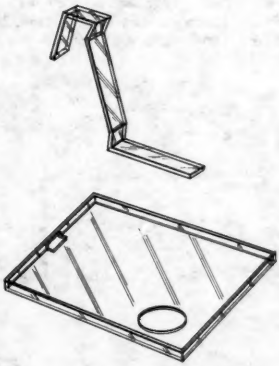
286,342
SHOE SOLE
Jerry D. Stubblefield, Portland, Oreg., assignor to Pensa, Inc., Portland, Oreg.
Filed Oct. 1, 1985, Ser. No. 782,420
Term of patent 14 years
U.S. Cl. D2—320



286,343
COMBINED SUPPORT AND STAND FOR A NEEDLEWORK FRAME
Bradley L. Geisler, Rte. 1, Osceola, Wis. 54020
Filed Jan. 13, 1984, Ser. No. 570,395
Term of patent 14 years
U.S. Cl. D3—26

286,344
SERVING TRAY FOR AN AUTOMOBILE
James E. Hughes, Jr., 10519 Broadleaf Dr., Largo, Md. 20772
Filed Jun. 8, 1984, Ser. No. 618,910
Term of patent 14 years
U.S. Cl. D3—40

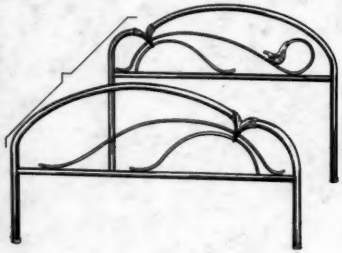




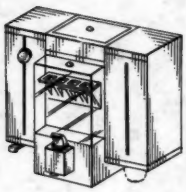
286,345
STOOL
Louis Stanislawski, Jr., and Ruby Stanislawski, both of 2017 W. Ohio St., Chicago, Ill. 60612
Filed Mar. 5, 1984, Ser. No. 586,401
Term of patent 14 years
U.S. Cl. D6—349

286,346
BICYCLE SEAT CUSHION
Cephia D. Woods, 2832 W. Amelia St., Orlando, Fla. 32805
Filed Aug. 13, 1984, Ser. No. 639,809
Term of patent 14 years
U.S. Cl. D6—502

286,347
BED FRAME
Paolo Porro, Como, Italy, assignor to Porro & Porro, S.r.l, Italy
Filed Feb. 4, 1985, Ser. No. 697,781
Claims priority, application Italy, Aug. 9, 1984, 22827[U]
Term of patent 14 years
U.S. Cl. D6—507



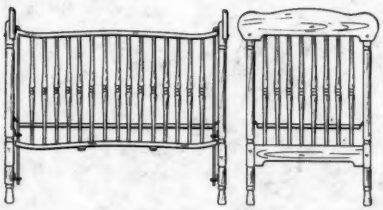
286,348
BATHROOM CABINET
Herbert L. Gaudet, Sr., 6860 Holly Park Dr. South, #504, Seattle, Wash. 98118
Filed Aug. 3, 1984, Ser. No. 637,637
Term of patent 14 years
U.S. Cl. D6—516



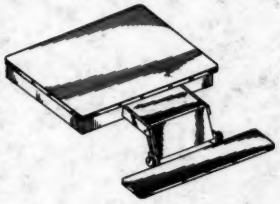
286,349
TOOTHBRUSH HOLDER
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,735
Term of patent 14 years
U.S. Cl. D6—534

286,350
CHAIR
Niels Diffrient, 879 N. Salem Rd., Ridgefield, Conn. 06877
Filed Jun. 8, 1984, Ser. No. 618,514
Term of patent 14 years
U.S. Cl. D6—366

286,351
CRIB
Roy E. Knoedler, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.
Filed Nov. 10, 1983, Ser. No. 550,867
Term of patent 14 years
U.S. Cl. D6—390

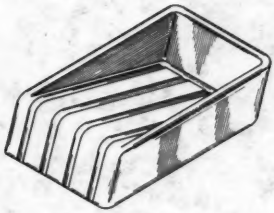


286,352
ADJUSTABLE COMPUTER STAND
William Huculak, 1801 Pepper Rd., Petaluma, Calif. 94952
Filed Aug. 18, 1983, Ser. No. 524,430
Term of patent 14 years
U.S. Cl. D6—430

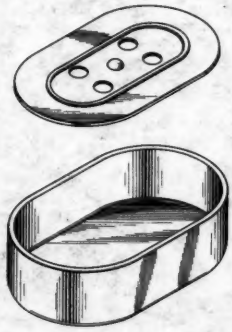


286,353
MULTI-TIERD DATA PROCESSING WORK TABLE OR SIMILAR ARTICLE
Claude J. Robolin, P.O. Box 592, Lavonia, Ga. 30553
Filed May 29, 1984, Ser. No. 614,539
Term of patent 14 years
U.S. Cl. D6—474

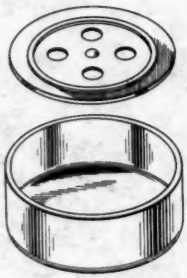
286,354
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,730
Term of patent 14 years
U.S. Cl. D6—536



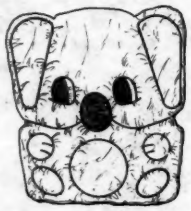
286,355
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,731
Term of patent 14 years
U.S. Cl. D6—536



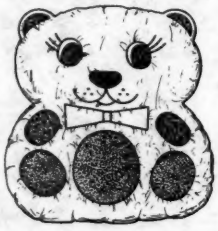
286,356
SOAP DISH
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,729
Term of patent 14 years
U.S. Cl. D6—536



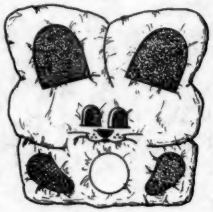
286,357
RUG OR SIMILAR ARTICLE
Michael W. Thomas, and Patricia J. Thomas, both of 23 Blaxland Avenue, Two Rocks, Western Australia, Australia
Filed Apr. 17, 1984, Ser. No. 601,367
Term of patent 14 years
U.S. Cl. D6—587



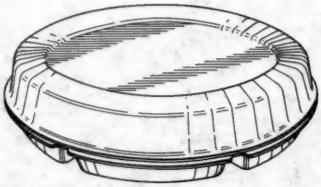
286,358
RUG OR SIMILAR ARTICLE
Michael W. Thomas, and Patricia J. Thomas, both of 23 Blaxland Avenue, Two Rocks, Western Australia, Australia
Filed Jul. 15, 1983, Ser. No. 514,254
Term of patent 14 years
U.S. Cl. D6—589

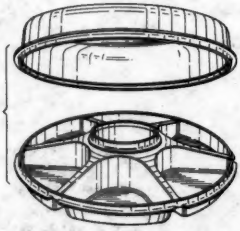


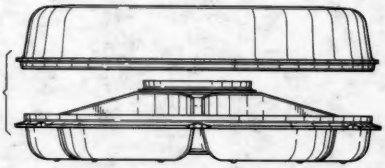
286,359
RUG OR SIMILAR ARTICLE
Michael W. Thomas, and Patricia J. Thomas, both of 23 Blaxland Avenue, Two Rocks, Western Australia, Australia
Filed Jul. 15, 1983, Ser. No. 514,331
Term of patent 14 years
U.S. Cl. D6—589



286,360
COVERED FOOD SERVING TRAY OR THE LIKE
Jody A. Trivison, Wooster, Ohio, assignor to Dart Industries, Inc., Northbrook, Ill.
Filed Sep. 29, 1983, Ser. No. 537,871
Term of patent 14 years
U.S. Cl. D7—17

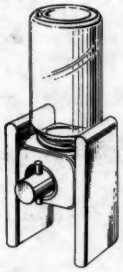




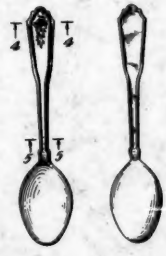


286,361
COASTER OR THE LIKE
Mark P. Zieff, Lexington, Mass., assignor to Dart Industries Inc, Northbrook, Ill.
Filed Sep. 29, 1983, Ser. No. 537,874
Term of patent 14 years
U.S. Cl. D7—45

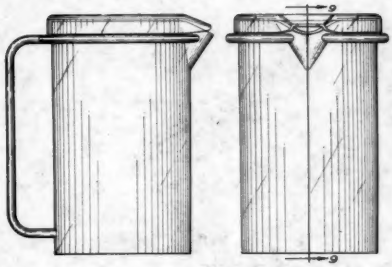
286,362
PELLET DISPENSER
Charles E. Lair, 11440 Surco Dr., San Diego, Calif. 92126
Filed Aug. 22, 1983, Ser. No. 525,000
Term of patent 14 years
U.S. Cl. D7—76



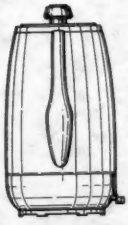
286,363
SPOON OR SIMILAR ARTICLE
Siro R. Toffolon, River Bend, Old-Lyme, Conn. 06371
Filed Jul. 11, 1984, Ser. No. 629,986
Term of patent 14 years
U.S. Cl. D7—150



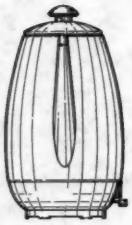
286,364
TRANSPARENT JUG
Bruno Gecchelin, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Dec. 28, 1983, Ser. No. 566,415
Claims priority, application Italy, Jun. 28, 1983, 22237/83[U]
Term of patent 14 years
U.S. Cl. D7—317



286,365
PERCOLATOR
Dan E. Gremonprez, and William C. Cesaroni, both of Glenview, Ill., assignors to Dart Industries, Inc., Northbrook, Ill.
Filed Sep. 24, 1984, Ser. No. 653,628
Term of patent 14 years
U.S. Cl. D7—321

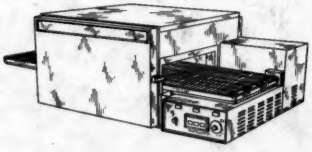


286,366
PERCOLATOR
Dan E. Gremonprez, West Bend, Wis., and William C. Cesaroni, Glenview, Ill., assignors to Dart Industries, Inc., Northbrook, Ill.
Filed Oct. 4, 1984, Ser. No. 657,634
Term of patent 14 years
U.S. Cl. D7—321

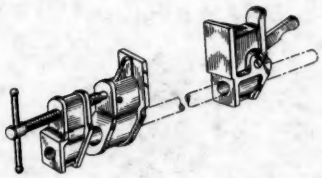


286,367
BEVERAGE DECANTER
Kent W. Murphy, Wooster, Ohio, assignor to Rubbermaid Incorporated, Wooster, Ohio
Filed Jul. 15, 1983, Ser. No. 513,829
Term of patent 14 years
U.S. Cl. D7—321

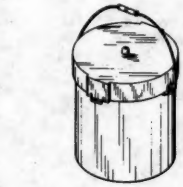
286,368
OVEN
Mitchell C. Henke, Fort Wayne, Ind., and Donald G. Wolfe, Lake Barrington, Ill., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.
Filed Dec. 14, 1984, Ser. No. 681,931
Term of patent 14 years
U.S. Cl. D7—338

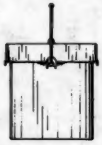


286,369
CLAMP
Ronald R. Hahn, Barrington, Ill., assignor to Hahn Manufacturing Co., Franklin Park, Ill.
Filed Jun. 6, 1983, Ser. No. 501,522
Term of patent 14 years
U.S. Cl. D8—72

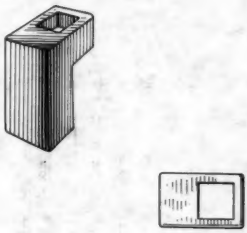


286,370
WIRE DE-REELING PAIL
Harold L. Wirts, Garrett, and Horace B. Corner, Fort Wayne, both of Ind., assignors to Mossberg Industries, Inc., Garrett, Ind.
Filed May 17, 1984, Ser. No. 611,488
Term of patent 14 years
U.S. Cl. D8—356





286,371
MAGNETIC SIGN HOLDER
Bernard E. Shuman, 3230 Clubhouse Rd., Merrick, N.Y. 11566
Filed Aug. 6, 1985, Ser. No. 762,969
Term of patent 14 years
U.S. Cl. D8—373



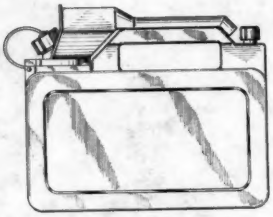
286,372
BOLT
Royce W. Hill, Flippin, Ark., assignor to Ark-Plas Products Inc., Flippin, Ark.
Filed Dec. 28, 1984, Ser. No. 687,028
Term of patent 14 years
U.S. Cl. D8—387

286,373
SCREW
Royce W. Hill, Flippin, Ark., assignor to Ark-Plas Products Inc., Flippin, Ark.
Filed Dec. 28, 1984, Ser. No. 687,029
Term of patent 14 years
U.S. Cl. D8—387

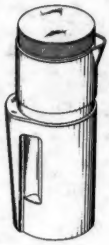
286,374
LOTION DISPENSING BOTTLE
Vanda J. Bussell, 283 Nottingham Rd., Ramsey, N.J. 07446
Filed Jun. 28, 1984, Ser. No. 625,732
Term of patent 14 years
U.S. Cl. D9—300

286,375
COMBINED DRINK STIRRER AND CONTAINER FOR A LIQUID REFRIGERANT
Hal Taub, 561 Acorn St., Deer Park, N.Y. 11729
Filed Oct. 26, 1983, Ser. No. 545,370
Term of patent 14 years
U.S. Cl. D9—337

286,376
COMBINED LIQUID CONTAINER AND ROTATABLE SPOUT
Andrew S. Bianco, Lima, Ohio, assignor to The Dyson-Kissner-Moran Corporation, New York, N.Y.
Filed Mar. 29, 1984, Ser. No. 594,654
Term of patent 14 years
U.S. Cl. D9—341

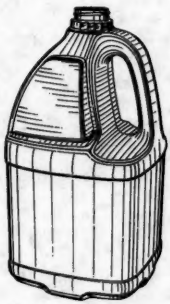


286,377
CONTAINER FOR THE PREPARATION OF READY TO BE USED LIQUID DETERGENTS
Nistri Ugo, Genoa, Italy, assignor to Mira Lanza S.p.A., Genoa, Italy
Filed Dec. 28, 1983, Ser. No. 567,523
Claims priority, application Italy, Jul. 8, 1983, 15213/83[U]
Term of patent 14 years
U.S. Cl. D9—341

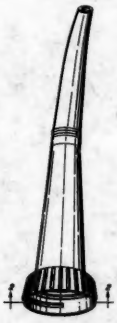


286,378
PACKAGING CONTAINER
Michael G. Banfield, 10844 139A St., Surrey, British Columbia, Canada V3R 3E5
Filed Aug. 15, 1983, Ser. No. 522,984
Term of patent 14 years
U.S. Cl. D9—346

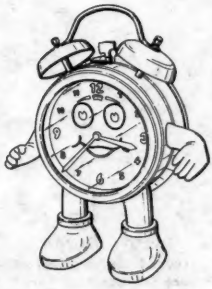
286,379
BOTTLE OR SIMILAR ARTICLE
Gerard E. Lyons, Burlington, Canada, assignor to Polybottle, Weston, Canada
Filed Jul. 19, 1984, Ser. No. 632,355
Claims priority, application Canada, Apr. 2, 1984, 02-04-84-13
Term of patent 14 years
U.S. Cl. D9—370



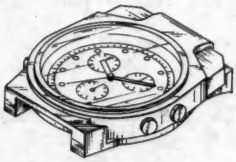
286,380
POURING SPOUT
Walter D. Harman, 6990 Bucktrout Pl., Worthington, Ohio 43085
Filed Jan. 4, 1984, Ser. No. 568,042
Term of patent 14 years
U.S. Cl. D9—447



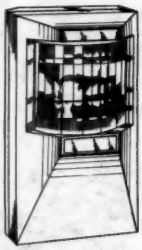
286,381
ALARM CLOCK
Hans K. Zeisel, Waiblinger Strasse 25, D-7054 Korb, Fed. Rep. of Germany
Filed Oct. 7, 1983, Ser. No. 540,604
Claims priority, application Fed. Rep. of Germany, Apr. 22, 1983, 942
Term of patent 14 years
U.S. Cl. D10—8



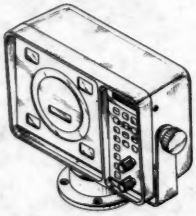
286,382
WATCH
Jiro Matsuo, Chiba, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Oct. 10, 1984, Ser. No. 659,241
Claims priority, application Japan, Apr. 11, 1984, 59-14403
Term of patent 14 years
U.S. Cl. D10—39



286,383
PASSIVE INFRA-RED SENSOR
Yaacov Kotlicki, 20 Yoav St., Ramat Gan, and Moshe Kotlicki, 24 Weisburg St., Tel Aviv, both of Israel
Filed Oct. 11, 1984, Ser. No. 659,944
Term of patent 14 years
U.S. Cl. D10—106



286,384
DEPTH SOUNDER
Henry G. Grilk, West Milford, N.J., assignor to Aqua Meter Instrument Corporation, Roseland, N.J.
Filed Aug. 15, 1984, Ser. No. 641,072
Term of patent 14 years
U.S. Cl. D10—46



286,385
WRISTWATCH BAND
Gianni Bulgari, Rome, Italy, assignor to Sotiro Bulgari Di Costantino E Giorgio Bulgari S.a.S., Rome, Italy
Filed May 2, 1983, Ser. No. 490,559
Claims priority, application Italy, Jan. 24, 1983, 35548/83[U]
Term of patent 14 years
U.S. Cl. D11—19

286,386
RELIGIOUS ORNAMENT FOR JEWELRY OR THE LIKE
Susanna M. Orr, 389 S. Edison St., Elgin, Ill. 60120
Filed May 29, 1984, Ser. No. 614,780
Term of patent 14 years
U.S. Cl. D11—86

286,387
DIAMOND
Mitsugi Ishida, 72-81 113th St., Forest Hills, N.Y. 11375
Filed Mar. 21, 1984, Ser. No. 591,917
Term of patent 14 years
U.S. Cl. D11—90

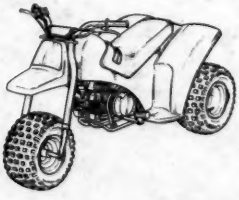
286,388
DIAMOND
Mitsugi Ishida, 72-81 113th St., Forest Hills, N.Y. 11375
Filed Mar. 21, 1984, Ser. No. 591,919
Term of patent 14 years
U.S. Cl. D11—90

286,389
MEDALLION
Bette B. Davidson, 303 N. Lancaster Ave., Margate, N.J. 08402
Filed Oct. 4, 1984, Ser. No. 657,621
Term of patent 14 years
U.S. Cl. D11—114

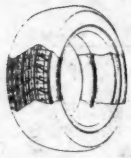
286,390
STATUETTE
Nathan W. Groce, 3008 W. Shangri La Rd., Phoenix, Ariz. 85029
Filed Nov. 29, 1984, Ser. No. 676,476
Term of patent 14 years
U.S. Cl. D11—157

286,391
ROUND TROPHY BASE
Freddy T. Lee, 467 SE. Whitmore Dr., Port St. Lucie, Fla. 33452
Filed May 4, 1984, Ser. No. 607,317
Term of patent 14 years
U.S. Cl. D11—164

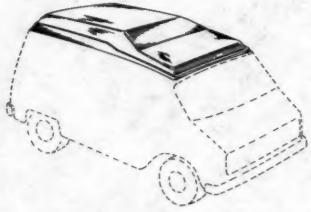
286,392
MOTORTRICYCLE
Yukihiko Matsue, Tokyo, Japan, assignor to Yamaha Hatsudoki Kabushiki Kaisha, Japan
Filed Apr. 11, 1983, Ser. No. 483,511
Claims priority, application Japan, Oct. 13, 1982, SHO 57-46.599
Term of patent 14 years
U.S. Cl. D12—110



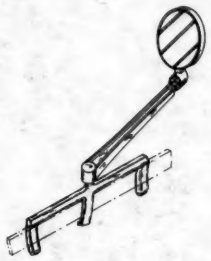
286,393
AUTOMOBILE TIRE
Izumi Kuramochi; Hiroshi Tokizaki, both of Tokyo; Kazuyoshi Saneto, and Daisuke Higashide, both of Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co., Ltd., Tokyo, Japan
Filed Sep. 14, 1983, Ser. No. 532,230
Claims priority, application Japan, Mar. 16, 1983, 58-10728
The portion of the term of this patent subsequent to May 27, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—147



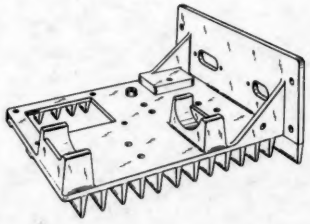
286,394
VAN TOP
William P. Johnson, Syracuse, and Charles B. Bonifield, Warsaw, both of Ind., assignors to Coachmen Industries, Inc., Elkhart, Ind.
Filed Apr. 2, 1984, Ser. No. 595,607
Term of patent 14 years
U.S. Cl. D12—156



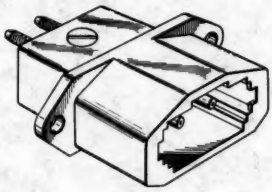
286,395
ARTICULATED REAR VIEW MIRROR FOR ATTACHMENT TO EYE GLASSES
John W. Greenlaw, 1908 Nero Ct., Walnut Creek, Calif. 94596; Karsten Kettlitz, 14633 Darius Way, San Leandro, Calif. 94578, and Gary R. Schlueter, 17472 Almond Rd., Castro Valley, Calif. 94546
Filed Aug. 27, 1984, Ser. No. 644,761
Term of patent 14 years
U.S. Cl. D12—189



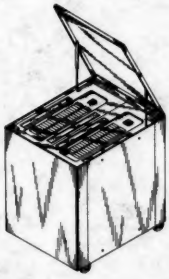
286,396
POWER SUPPLY HEAT SINK
Thomas J. Luciano, Rochester, N.Y., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Feb. 29, 1984, Ser. No. 584,665
Term of patent 14 years
U.S. Cl. D13—23



286,397
ELECTRICAL CONNECTOR SOCKET
John C. Challans, Kislingbury, England, assignor to Plessey Overseas Limited, Ilford, England
Filed Jan. 17, 1984, Ser. No. 571,444
Claims priority, application United Kingdom, Jul. 20, 1983, 1014238
Term of patent 14 years
U.S. Cl. D13—24



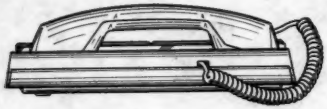
286,398
AUXILIARY CIRCUIT BREAKER SYSTEM
John E. Lines, 25952 Lines La., Kittredge, Colo. 80457
Filed Sep. 26, 1983, Ser. No. 535,631
Term of patent 14 years
U.S. Cl. D13—34

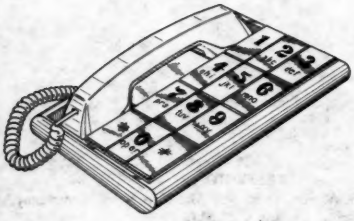


286,399
SPEAKER DIAPHRAGM
Erazm A. Willy, 128 Country Manor Way, Apt. #7, Webster, N.Y. 14580
Filed Jun. 2, 1983, Ser. No. 500,370
Term of patent 14 years
U.S. Cl. D14—30

286,400
TELEPHONE
Theodore O. S. Moller, R.R. #3, Marsden Road, Courtenay, British Columbia, Canada V9N 5M8
Filed Oct. 16, 1984, Ser. No. 661,443
Claims priority, application Canada, Jun. 7, 1984, 07-06-84-5
Term of patent 14 years
U.S. Cl. D14—53

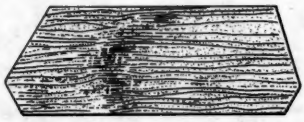
286,401
TELEPHONE SET
James T. Asaki, Raleigh, N.C., assignor to ITT Corporation, New York, N.Y.
Filed Sep. 28, 1984, Ser. No. 655,969
Term of patent 14 years
U.S. Cl. D14—53





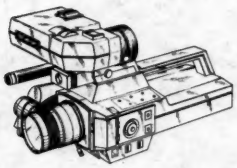
286,402
COMBINATION HANDSET TELEPHONE AND STAND SET
Connie K. Huber, 317 4th St., Oakmont, Pa. 15139
Filed Jun. 29, 1984, Ser. No. 625,956
Term of patent 14 years
U.S. Cl. D14—53

286,403
CONSOLE FOR TELECONFERENCE COMMUNICATION
David Parshad, Ottawa, Canada; Waco Butram, Capron, Ill., and Radamis Botros, Nepean, Canada, assignors to Darome, Inc., Harvard, Ill.
Filed Dec. 8, 1983, Ser. No. 559,364
Term of patent 14 years
U.S. Cl. D14—59



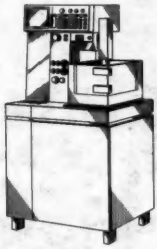
286,404
TELEPHONE HANDSET OR SIMILAR ARTICLE
Jeffrey A. Skigen, Vienna; James C. P. Lum, Herndon, both of Va., and C. Thomas Taylor, Leawood, Kans., assignors to GTE Telenet Communications Corporation, Reston, Va.
Filed Nov. 30, 1984, Ser. No. 677,010
Term of patent 14 years
U.S. Cl. D14—63

286,405
VIDEO CAMERA
Masakatu Iwasaki, Koganei; Hideyo Hyuga, and Kazunori Hashimoto, both of Tokyo, all of Japan, assignors to Hitachi Ltd., Tokyo, Japan
Filed Mar. 9, 1983, Ser. No. 473,851
Claims priority, application Japan, Sep. 20, 1982, 57-42468
Term of patent 14 years
U.S. Cl. D14—78



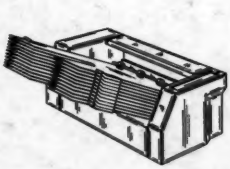
286,406
COMBINED STAND AND HOUSING FOR VIDEO DISPLAY UNIT
Geoffrey D. Gahan, Great Missenden, England, assignor to Mouldmaking Design Centre Limited, Amersham, England
Continuation-in-part of Ser. No. 475,673, Mar. 15, 1983, abandoned. This application Dec. 14, 1983, Ser. No. 561,367
Claims priority, application United Kingdom, Dec. 13, 1982, 1010256; Jun. 14, 1983, 1013539
Term of patent 14 years
U.S. Cl. D14—113

286,407
MACHINE FOR CUTTING WORKPIECES UTILIZING ELECTRIC DISCHARGE
Kazuo Itoh, Aichi; Makoto Goto, Toki, and Yasuyo Isaji, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan
Filed Aug. 31, 1984, Ser. No. 646,206
Claims priority, application Japan, Mar. 14, 1984, 59-9891
Term of patent 14 years
U.S. Cl. D15—127

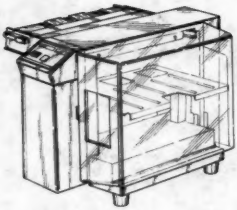


286,408
MOTOR DRIVE UNIT FOR A CAMERA
Lave Tenne, Kungsbacka, Sweden, assignor to Victor Hasselblad AB, Goteborg, Sweden
Filed Nov. 28, 1984, Ser. No. 675,740
Claims priority, application Sweden, May 28, 1984, 841649
Term of patent 14 years
U.S. Cl. D16—10

286,409
SORTER
Mikio Kosako, and Harumi Fukuda, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed May 16, 1984, Ser. No. 610,673
Claims priority, application Japan, Nov. 22, 1983, 58-50834
Term of patent 14 years
U.S. Cl. D16—32

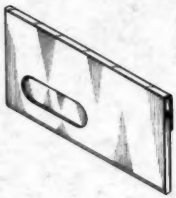


286,410
PAPER FEEDER FOR ELECTRONIC COPYING MACHINE
Kunio Hara, Chiba, Japan, assignor to Kabushiki Kaisha Toshiba, Japan
Filed Jun. 19, 1984, Ser. No. 622,150
Claims priority, application Japan, Dec. 20, 1983, 58-54569
Term of patent 14 years
U.S. Cl. D16—32



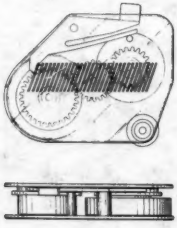
286,411
MUSICAL INSTRUMENT FOR PRE-SCHOOL CHILDREN
William M. Maryniak, 4 N. 186 Walter Dr., Addison, Ill. 60101
Filed Mar. 2, 1984, Ser. No. 585,920
Term of patent 14 years
U.S. Cl. D17—99

286,412
MAILING ENVELOPE
Bruce E. Bourgeois, 807 Arlington Cr., Richmond, Va. 23229
Filed Oct. 3, 1983, Ser. No. 538,176
Term of patent 14 years
U.S. Cl. D19—3

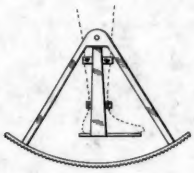


286,413
VIOLIN LEARNING BOARD
John C. DeFrancesco, 3162 Fowler, Omaha, Nebr. 68111
Filed Sep. 6, 1983, Ser. No. 529,476
Term of patent 14 years
U.S. Cl. D19—59

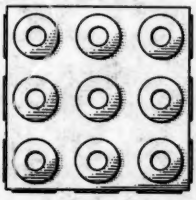
286,414
GLUE DISPENSER
Vittorio Pappalardo, Pessano Con Bornago, Italy, assignor to B.V.A.S. r.l., Milan, Italy
Filed Apr. 4, 1985, Ser. No. 719,997
Term of patent 14 years
U.S. Cl. D19—66



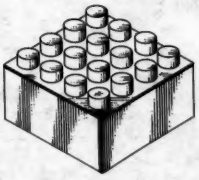
286,415
WALKING STILT
James W. Dillard, 118 N. Main St., Cedar Hill, Tex. 75104
Filed Apr. 23, 1984, Ser. No. 603,152
Term of patent 14 years
U.S. Cl. D21—72



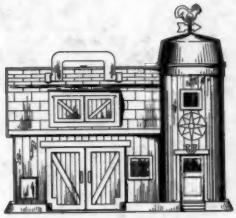
286,416
TOY CONSTRUCTION PIECE
Kenzou Kassai, Osaka, Japan, assignor to Kassai Kabushiki Kaisha, Osaka, Japan
Division of Ser. No. 508,514, Jun. 28, 1983. This application Sep. 30, 1985, Ser. No. 781,708
Claims priority, application Japan, Dec. 29, 1982, 57-58161
Term of patent 14 years
U.S. Cl. D21—108



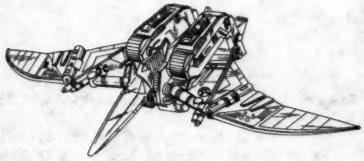
286,417
TOY CONSTRUCTION PIECE
Tokuo Takahashi, Tokyo, Japan, assignor to Kawada Co., Ltd., Tokyo, Japan
Filed Sep. 10, 1984, Ser. No. 648,526
Claims priority, application Japan, May 30, 1984, 59-21774
Term of patent 14 years
U.S. Cl. D21—108



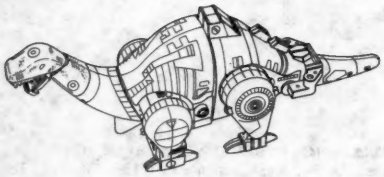
286,418
TOY BARN
Mel Appel, Livingston, and George Kress, Scotch Plains, both of N.J., assignors to The Mel Appel Company, Short Hills, N.J.
Filed Nov. 19, 1984, Ser. No. 673,038
Term of patent 14 years
U.S. Cl. D21—116



286,419
RECONFIGURABLE DINOSAURIAN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed Aug. 16, 1984, Ser. No. 641,372
Claims priority, application Japan, May 1, 1984, 59-17944
Term of patent 14 years
U.S. Cl. D21—148



286,420
RECONFIGURABLE DINOSAURIN TOY
Kouzin Ohno, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,423
Claims priority, application Japan, Apr. 10, 1984, 59-14286
Term of patent 14 years
U.S. Cl. D21—148



286,421
RECONFIGURABLE TOY LION
Masaki Maruyama, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan
Filed May 30, 1984, Ser. No. 616,422
Claims priority, application Japan, Jan. 31, 1984, 59-3049
Term of patent 14 years
U.S. Cl. D21—163

286,422
ANGEL-DOLL
Dorothy M. Dickerson, P.O. Box 208, Noble, Ill. 62868
Filed Jul. 5, 1984, Ser. No. 627,817
Term of patent 14 years
U.S. Cl. D21—169

286,423
CHILDREN'S PLAY GYM
D. Scott Saxman, and William H. Ziegler, Jr., both of Bedford, Pa., assignors to Hedstrom Corporation, Bedford, Pa.
Filed Nov. 25, 1983, Ser. No. 555,281
Term of patent 14 years
U.S. Cl. D21—244

286,424
MOUNTING FOR A SIGHTING INSTRUMENT
Johan A. I. Ekstrand, Utteröd 1, S-240 33 Löeröd, Sweden
Filed Feb. 22, 1984, Ser. No. 582,634
Claims priority, application Sweden, Sep. 8, 1983, 83-2297
Term of patent 14 years
U.S. Cl. D22—110

286,425

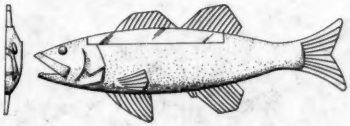
MAGNETIC FISH LURE HOLDER

Gerald A. Haase, 1005 Country Club Rd., Lake Oswego, Oreg. 97034

Filed Mar. 28, 1984, Ser. No. 594,139

Term of patent 14 years

U.S. Cl. D22—22



286,426

ELECTRIC SPRAY GUN

Bih-Ju Lin, No. 157-8, Hu Nei Sub-Ward, Chia-I City, Taiwan

Filed Mar. 15, 1984, Ser. No. 590,422

Term of patent 14 years

U.S. Cl. D23—18

286,427

OIL-FIRED SPACE HEATER

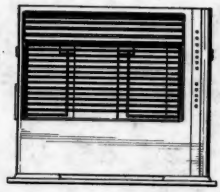
Kazuharu Nakamura, Nagoya, Japan, assignor to Toyotomi Kogyo Co., Ltd., Aichi, Japan

Filed Dec. 17, 1984, Ser. No. 682,135

Claims priority, application Japan, Jun. 19, 1984, 59-25279

Term of patent 14 years

U.S. Cl. D23—122



286,428

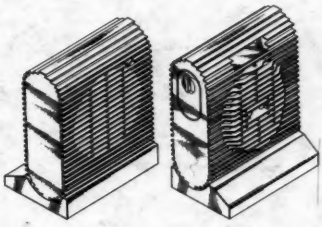
ENCLOSURE FOR AN ELECTRIC HEATER FAN

Chung C. Liu, Brea, Calif., assignor to Tatung Company of America, Inc., Long Beach, Calif.

Filed Jun. 6, 1984, Ser. No. 617,981

Term of patent 14 years

U.S. Cl. D23—122



286,429

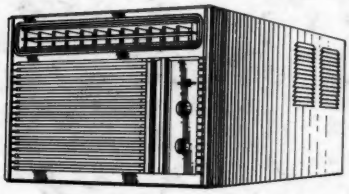
AIR CONDITIONER

Masao Miyake; Shinichi Yokoyama, and Nobuo Takaishi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

Filed May 3, 1984, Ser. No. 607,012

Term of patent 14 years

U.S. Cl. D23—141



286,430

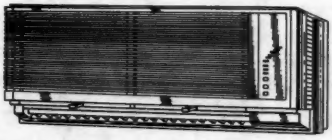
AIR CONDITIONER

Masao Miyake; Shinichi Yokoyama, and Nobuo Takaishi, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan

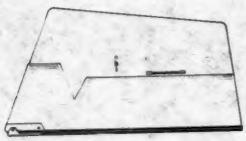
Filed Jun. 26, 1984, Ser. No. 624,835

Term of patent 14 years

U.S. Cl. D23—141

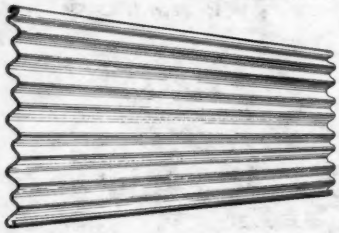


286,431
VEHICLE SHELTER
Terry O. McDaris, Rte. 2, Box 58-8D, Afton, Okla. 74331; John R. Loux, 10309 Osage Dr., Broken Arrow, Okla. 74014, and Barry L. Jeppesen, Rte. 1, Box 1373C, Broken Arrow, Okla. 74012
Filed Mar. 21, 1984, Ser. No. 591,958
Term of patent 14 years
U.S. Cl. D25—1

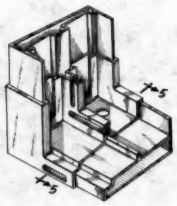


286,432
KIOSK
Paul Markham, The Hedges, Highmeadow, Newport, Shropshire, England (TF10 7TN)
Filed Apr. 11, 1984, Ser. No. 599,085
Claims priority, application United Kingdom, Oct. 14, 1983, 1015694
Term of patent 14 years
U.S. Cl. D25—19

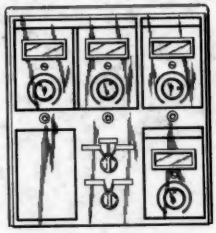
286,433
PANEL FOR ROLLING GATES
Vincent Greco, 195 Huntington Ave., Bronx, N.Y. 10465
Filed May 13, 1983, Ser. No. 494,523
Term of patent 14 years
U.S. Cl. D25—50



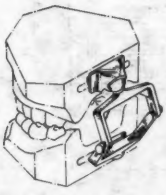
286,434
PLASTIC WINDOW FRAME CORNER OR THE LIKE
Dietrich F. Schmidt, Camp Hill, Pa., assignor to Capitol Products Corporation, Mechanicsburg, Pa.
Filed Aug. 1, 1983, Ser. No. 519,425
Term of patent 14 years
U.S. Cl. D25—52



286,435
MEDICAL CONTROL PANEL FOR AN IRRIGATION, LAVAGE AND SUCTION APPARATUS OR THE LIKE
Robert W. Atkinson, Dover, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio
Filed Dec. 1, 1982, Ser. No. 445,880
Term of patent 14 years
U.S. Cl. D24—8



286,436
DENTAL ARTICULATOR WITH A TAB MOUNTING
Ronald E. Huffman, Tucson, Ariz., assignor to KV33 Corporation, Tucson, Ariz.
Filed Mar. 21, 1983, Ser. No. 477,076
Term of patent 14 years
U.S. Cl. D24—10

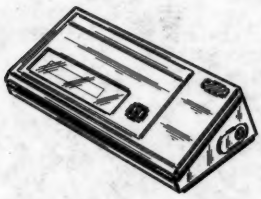


286,437

ELECTRONIC SPHYGMOMANOMETER

Hiroshi Nishibori, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan

Filed Nov. 15, 1983, Ser. No. 552,167
Term of patent 14 years
U.S. Cl. D24—21

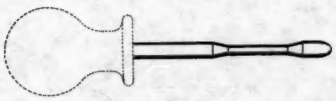


286,438

SURGICAL OBTURATOR

Philip R. Lichtman, Newton, and John C. Strahan, Arlington, both of Mass., assignors to Acufex Microsurgical Inc., Norwood, Mass.

Filed May 16, 1983, Ser. No. 494,890
Term of patent 14 years
U.S. Cl. D24—26

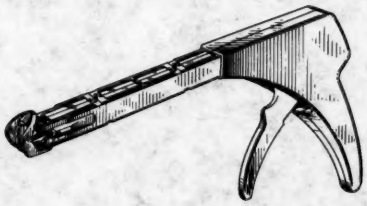


286,439

COMBINED SURGICAL OCCLUDING AND CUTTING INSTRUMENT

David T. Green, Norwalk; Paul O. Rawson, Easton, and Richard Yagami, Bridgewater, all of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 23, 1984, Ser. No. 573,048
Term of patent 14 years
U.S. Cl. D24—26

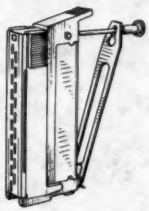


286,440

CARTRIDGE FOR SURGICAL FASTENER APPLYING APPARATUS

David T. Green, Norwalk, Conn., assignor to United States Surgical Corporation, Norwalk, Conn.

Filed Jan. 20, 1984, Ser. No. 572,673
Term of patent 14 years
U.S. Cl. D24—27

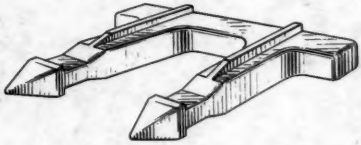


286,441

SURGICAL FASTENER

Herbert W. Korthoff, Wilton, and David T. Green, Norwalk, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

Filed Oct. 16, 1984, Ser. No. 663,070
Term of patent 14 years
U.S. Cl. D24—27

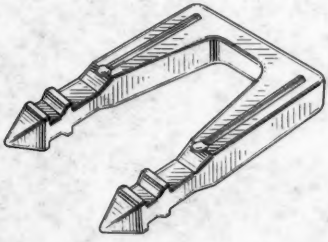


286,442

SURGICAL FASTENER

Herbert W. Korthoff, Wilton, and Ronald L. Crossley, Wallingford, both of Conn., assignors to United States Surgical Corporation, Norwalk, Conn.

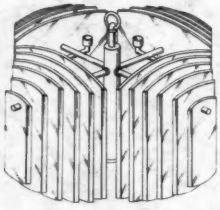
Filed Dec. 31, 1985, Ser. No. 814,964
Term of patent 14 years
U.S. Cl. D24—27



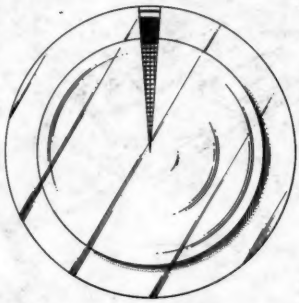
286,443
TEETHER
Harry S. Thomson, Richmond; David M. Raffo, and John A. Pape, both of Hitchin, all of England, assignors to Hestair Kiddicraft Limited, Surrey, England
Filed Feb. 1, 1984, Ser. No. 575,831
Claims priority, application United Kingdom, Nov. 9, 1983, 1016175
Term of patent 14 years
U.S. Cl. D24—45

286,444
LIGHTING FIXTURE
Michael T. Jankowski, Leek, and Hans T. Meelen, Geldrop, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Filed May 11, 1984, Ser. No. 609,246
Claims priority, application Benelux, Nov. 17, 1983, 58433-02
Term of patent 14 years
U.S. Cl. D26—65

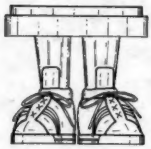
286,445
CHANDELIER
Mark Sink, Inglewood, Calif., assignor to Forecast Lighting Company, Inglewood, Calif.
Filed Jan. 17, 1985, Ser. No. 692,168
Term of patent 14 years
U.S. Cl. D26—86



286,446
LENS FOR HAZARD WARNING LAMP OR SIMILAR ARTICLE
Italo Caroli, Montreal, Canada, and Alfred G. Tienken, Syracuse, N.Y., assignors to R. E. Dietz, Syracuse, N.Y.
Filed Jul. 9, 1984, Ser. No. 629,002
Term of patent 14 years
U.S. Cl. D26—123



286,447
ASHTRAY
Roy E. Satterfield, 309 Oak Park Dr., Knoxville, Tenn. 37918
Filed Sep. 27, 1983, Ser. No. 536,180
The portion of the term of this patent subsequent to Sep. 20, 2000, has been disclaimed.
Term of patent 14 years
U.S. Cl. D27—24



286,448
ASHTRAY
Donald L. Hartley, 17 Glendale Rd., Jacksonville, N.C. 28540
Filed Dec. 4, 1984, Ser. No. 678,108
Term of patent 14 years
U.S. Cl. D27—27

286,449

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

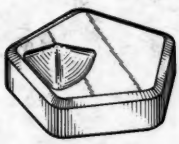
Filed Dec. 28, 1984, Ser. No. 687,333

Claims priority, application United Kingdom, Jul. 2, 1984, 1020680

The portion of the term of this patent subsequent to Oct. 28, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D28—2



286,450

PHARMACEUTICAL TABLET

Geoffrey D. Tovey, Harpenden, England, assignor to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

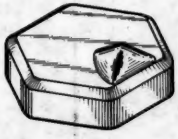
Filed Dec. 28, 1984, Ser. No. 687,334

Claims priority, application United Kingdom, Jul. 2, 1984, 1020681

The portion of the term of this patent subsequent to Oct. 28, 2000, has been disclaimed.

Term of patent 14 years

U.S. Cl. D28—2



286,451

COMBINED DRY SHAVER, COVER, AND BRUSH

Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Jul. 27, 1984, Ser. No. 634,938

Claims priority, application Fed. Rep. of Germany, Feb. 3, 1984, 73 MR 9247

Term of patent 14 years

U.S. Cl. D28—49

286,452

ELECTRIC DRY SHAVER

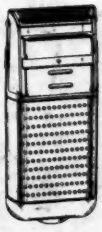
Roland Ullmann, Offenbach-Rumpenheim, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany

Filed Sep. 21, 1984, Ser. No. 653,112

Claims priority, application Fed. Rep. of Germany, Apr. 10, 1984, 73 MR 9270

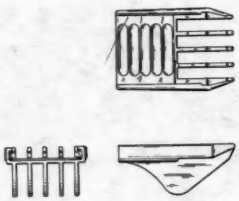
Term of patent 14 years

U.S. Cl. D28—49

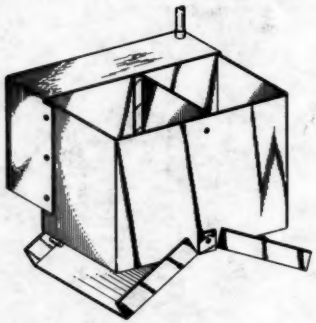


286,453
LADY SHAVER
Murray I. C. Camens, Groningen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Oct. 15, 1984, Ser. No. 661,527
Claims priority, application Benelux, Apr. 26, 1984, 58949-00
Term of patent 14 years
U.S. Cl. D28—49

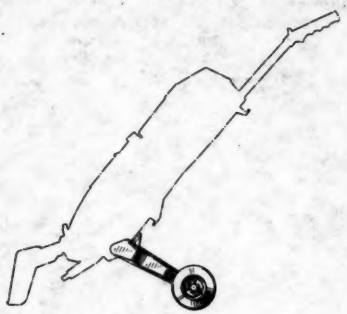
286,454
HAIR TRIMMER ATTACHMENT
Timothy D. Stephens, Sterling, Ill., assignor to Wahl Clipper Corporation, Sterling, Ill.
Filed Sep. 28, 1984, Ser. No. 656,031
Term of patent 14 years
U.S. Cl. D28—54

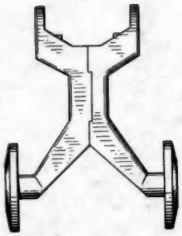


286,455
AUTOMATIC FEEDER FOR BARN ANIMALS
Daniel F. Pitzen, 1137 10th Ave. North, Clinton, Iowa 52732
Filed Aug. 20, 1984, Ser. No. 642,450
Term of patent 14 years
U.S. Cl. D30—15



286,456
FOLD DOWN WHEELS FOR CARPET CLEANER
Hugh F. Groth, Richfield, Ohio, assignor to The Regina Co., Inc., Rahway, N.J.
Filed Mar. 2, 1984, Ser. No. 585,727
Term of patent 14 years
U.S. Cl. D32—31





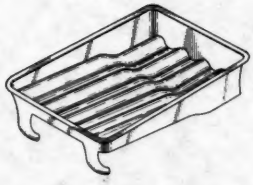
286,457
TOOL FOR CLEANING A GAS GRILL BURNER OR THE LIKE
Kenneth B. Thomas, 492 Branscomb Rd., Green Cove Springs, Fla. 32043
Filed May 14, 1984, Ser. No. 609,809
Term of patent 14 years
U.S. Cl. D32—49

286,458

PAINT TRAY FOR CORRUGATED ROLLER TYPE APPLICATOR

Juan Pages, 21 Gran Via St., Ponce, P.R.

Filed Jan. 11, 1983, Ser. No. 457,222
Term of patent 14 years
U.S. Cl. D32—53.1

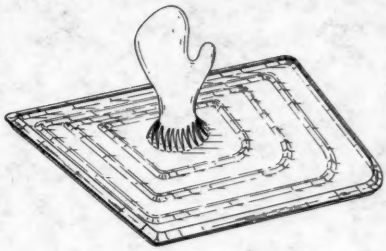


286,459

PAINT DRIP PAN

Ruth A. Nielsen, P.O. Box 507, Cibolo, Tex. 78108

Filed Sep. 17, 1984, Ser. No. 651,464
Term of patent 14 years
U.S. Cl. D32—53.1



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Osakeyhtio: *See*—
Henricson, Kaj O.; and Peltola, Pekka O., 4,619,736, Cl. 162-261.000.

A. Salvi & C. S.p.A.: *See*—
Perinetti, Alberto, 4,620,060, Cl. 174-42.000.

AB Volvo Penta: *See*—
Brandt, Lennart, 4,619,584, Cl. 416-129.000.

Abdulla, Riaz F.; and Samaritoni, Jack G., to Eli Lilly and Company. Pyridazinylurea compounds and methods of use as herbicides. 4,619,686, Cl. 71-92.000.

Abe, Kazuo; and Shimamura, Akira, to Nisshin-DCA Foods Inc. Dough forming device used for manufacturing cakes. 4,619,598, Cl. 425-131.100.

Abplanalp, George. Ointment applicator. 4,619,654, Cl. 604-897.000.

Achorn, Frank P.: *See*—
Salladay, David G.; and Achorn, Frank P., 4,619,684, Cl. 71-34.000.

Acker, Jesse L.: *See*—
Meserol, Peter M.; and Acker, Jesse L., 4,619,530, Cl. 356-440.000.

Acme United Corporation: *See*—
Sharkany, Edward J.; and Mathews, Richard J., Sr., 4,619,391, Cl. 227-19.000.

Adachi, Keiichi: *See*—
Takagi, Yoshihiro; and Adachi, Keiichi, 4,619,893, Cl. 430-519.000.

Adachi, Yuuma: *See*—
Tanaka, Hiroshi; Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,620,097, Cl. 250-327.200.

Adair, James H.: *See*—
Stambaugh, Edgel P.; Adair, James H.; Sekercioglu, Ibrahim; and Wills, Roger R., 4,619,817, Cl. 423-266.000.

Adeka Argus Chemical Co., Ltd.: *See*—
Haruna, Tohru; and Nishimura, Atsushi, 4,619,958, Cl. 524-102.000.

Ades, Adrian R.; Pribis, Paul B.; and Proach, Donald J., to General Electric Company. Dual coated radiant electrical heating element. 4,620,086, Cl. 219-552.000.

Adnyana, Dewa N.; and Rogen, Neil E., to Memory Metals, Inc. Subsurface well safety valve and control system. 4,619,320, Cl. 166-65.100.

Adrian, Willy; and Holzhauer, Ralf, to Otis Elevator Company. Escalator handrail entry safety switch actuator. 4,619,355, Cl. 198-323.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Frisbie, Jeffrey S.; and Samson, Wilfred J., 4,619,263, Cl. 128-344.000.
Morrison, David W., 4,619,274, Cl. 128-772.000.

Advanced Glass Systems, Inc.: *See*—
Smith, W. Novis, Jr., 4,619,973, Cl. 525-329.900.

Advanced Micro Devices, Inc.: *See*—
Brown, Andrew V., 4,619,837, Cl. 427-44.000.
Fang, Sheng, 4,620,117, Cl. 307-451.000.
Lee, Gil S.; and Subramaniam, A. Ram, 4,620,115, Cl. 307-443.000.

Agbay, Albert J.; and Thomas, Ralph H., Sr., to Robert Linkletter Associates, Ltd. Tamper resistant and tamper evident closures. 4,619,370, Cl. 215-225.000.

Agency of Industrial Science & Technology: *See*—
Hato, Masakatsu; Shimura, Yukio; and Tsuda, Keishiro, 4,619,897, Cl. 435-182.000.
Hiroki, Eizo, 4,619,301, Cl. 152-210.000.
Ohta, Kimihiro; Nakagawa, Tadashi; Kawai, Naoyuki; Kojima, Takeshi; and Kawashima, Mitsuo, 4,620,206, Cl. 357-4.000.
Sano, Toshio; Takahashi, Masaharu; Murakoshi, Yoichi; and Matsuno, Kenichi, 4,619,127, Cl. 72-56.000.

AGIP Nucleare S.p.A.: *See*—
Olivieri, Antonio; and Pochini, Giovanni, 4,620,106, Cl. 250-506.100.

Ahern, Roy E.: *See*—
Crear, William, III; and Ahern, Roy E., 4,619,216, Cl. 114-105.000.

Ahn, Jae-Hwan: *See*—
Thomas, Gareth; Ahn, Jae-Hwan; and Kim, Nack-Joon, 4,619,714, Cl. 148-12.00B.

Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, to Siemens Aktiengesellschaft. Method for producing orientation layers for liquid crystal displays and liquid crystal displays having orientation layers. 4,619,500, Cl. 350-341.000.

Aichi Machine Industry Co., Ltd.: *See*—
Motoyama, Kichizo; and Araki, Yoshiharu, 4,619,480, Cl. 296-217.000.

Aid-Pack, Inc.: *See*—
Hussey, Richard P., 4,619,645, Cl. 604-111.000.

Aiken, John A., Jr., to International Business Machines Corporation. Method for accessing a data set in a word processing system. 4,620,295, Cl. 364-900.000.

Aikens, Paul W., to Du Pont de Nemours, E. I., and Company. Orbital stripping device. 4,619,164, Cl. 83-200.000.

Air Products and Chemicals, Inc.: *See*—
Dyer, Paul N.; and Pierantozzi, Ronald, 4,619,910, Cl. 502-336.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Kazaoka, Kenichi; Ishikawa, Masanobu; and Nishikawa, Masumi, 4,619,548, Cl. 403-290.000.

Aizaki, Yoshihiko, to Fujitsu Limited. Initialize control system in a cash processing system. 4,620,087, Cl. 235-379.000.

Ajinomoto Company Incorporated: *See*—
Niki, Katsumi; Kobayashi, Katsuyoshi; Inoguchi, Hiroo; and Yagi, Tatsuhiko, 4,619,754, Cl. 204-290.00R.

Akabane, Hitoshi; and Ishiyama, Gen, to Toyoda Koki Kabushiki Kaisha. Grinding method of rounded annular corner on workpiece. 4,619,083, Cl. 51-289.00R.

Akazawa, Takashi: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Akiba, Nobuo: *See*—
Kameyama, Kazuhiro; and Akiba, Nobuo, 4,619,518, Cl. 355-4.000.

Aktiebolaget Hassle: *See*—
Brandstrom, Arne E.; and Lamm, Bo R., 4,620,008, Cl. 546-271.000.

Akzo NV: *See*—
Smits, Peter C. C., 4,620,034, Cl. 562-531.000.

Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClurg, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., to Philip Morris Incorporated. Tobacco processing. 4,619,276, Cl. 131-79.000.

Alca Enterprises, Inc.: *See*—
Kelly, Dean A.; and Brann, Strother H., 4,619,365, Cl. 206-503.000.

Alexander, William J. Weaver's platform. 4,619,295, Cl. 139-304.000.

Alldos Eichler KG: *See*—
Muller, Klaus; and Oberacker, Sieghard, 4,619,589, Cl. 417-388.000.

Allen, Henry E.: *See*—
Teodorescu, Tonel E.; and Banko, William, 4,619,146, Cl. 73-861.540.

Allied Corporation: *See*—
Leung, Roger Y.; and Polak, Anthony J., 4,619,988, Cl. 528-421.000.
Schreiner, Peter J.; Bolenbaugh, Daniel L.; and Krebs, David R., 4,619,347, Cl. 188-72.600.

Allmann, Gunther; and Wiessler, Hans, to USM Corporation. Stud welding device. 4,620,079, Cl. 219-98.000.

Alltech Corporation: *See*—
Charlton, Thomas J., 4,619,850, Cl. 428-38.000.

Alsop, Derek J., to Occidental Chemical Corporation. Process for the preparation of α-α-α-trifluoroanisoles. 4,620,040, Cl. 568-656.000.

Alvin, Kjell; and Hakansson, Kurt, to Asea Aktiebolag. Condition indicator. 4,620,156, Cl. 324-424.000.

ALZA Corporation: *See*—
Eckenhoff, James B.; Peery, John R.; and Landrau, Felix A., 4,619,652, Cl. 604-415.000.

Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, to Hitachi, Ltd.; and Hitachi Automotive Engineering Co., Ltd. Capacity control device for compressor. 4,619,595, Cl. 418-83.000.

Amano, Toshio; Fujioka, Yoshihisa; Nagai, Kunio; and Oda, Osamu, to Sony Corporation. Picture display device. 4,620,229, Cl. 358-194.100.

Amazawa, Takao: *See*—
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.

Ambafz, Emilio: *See*—
Matheson, Charles L.; Lane, Preston D.; Dieringer, James V.; and Ambafz, Emilio, 4,619,677, Cl. 55-510.000.

Ambrose, Wallace W.: *See*—
Hanker, Jacob S.; Terry, Bill C.; Ambrose, Wallace W.; and Lupton, Cecel R., 4,619,655, Cl. 623-1.000.

Amdahl Corporation: *See*—
Lee, James C. K., 4,620,215, Cl. 357-81.000.

American Cyanamid Company: *See*—
Parekh, Girish G., 4,619,999, Cl. 544-196.000.
Rickelton, William A., 4,619,816, Cl. 423-139.000.
Susi, Peter V., 4,619,956, Cl. 524-87.000.
Wright, William B., Jr.; and Press, Jeffery B., 4,619,941, Cl. 514-397.000.

American Semiconductor Equipment Technologies: *See*—
Welmers, Thomas E., 4,620,288, Cl. 364-518.000.

American Standard Inc.: *See*—
Nagel, Harry C., 4,619,425, Cl. 246-34.00R.

AMF Incorporated: *See*—
Hinkens, Harold, 4,619,489, Cl. 339-28.000.

AMF Tuboscope, Inc.: *See—*
Bains, James A., Jr., 4,620,152, Cl. 324-225.000.
Amikan Fishing Net Mfg. Co., Ltd.: *See—*
Hotta, Keiji, 4,619,108, Cl. 57-236.000.
Amoco Corporation: *See—*
Ely, Stephen R., 4,619,821, Cl. 423-579.000.
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., to Kulicke and Soffa Industries, Inc. Low inertia movable workstation. 4,619,395, Cl. 228-4.500.
AMP Incorporated: *See—*
Forney, Edgar W., Jr.; and Michael, George W., III, 4,619,496, Cl. 339-177.00R.
Amrotex AG: *See—*
Gmur, Peter, 4,619,857, Cl. 428-186.000.
Analgesic Associates: *See—*
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,619,934, Cl. 514-277.000.
Anchor Wire Corporation of Tennessee: *See—*
Hogg, James W., 4,619,430, Cl. 248-467.000.
Anderson, Carl P.; and Mayer, Edward F., to Ricoh Systems, Inc.; and Ricoh Company, Ltd. Copying apparatus with automatic bottom feeder. 4,619,450, Cl. 271-35.000.
Anderson, Carl R., to Shure Brothers, Inc. Tabletop speaker assembly. 4,620,317, Cl. 381-90.000.
Anderson, Del M., to General Foods Inc. Process for producing a rapidly water-soluble, free-flowing, sugar-free dry beverage mix. 4,619,833, Cl. 426-548.000.
Anderson, Iver E.: *See—*
Ayers, Jack D.; and Anderson, Iver E., 4,619,845, Cl. 427-422.000.
Andersson, Ingmar A., to KMW Aktiebolag. Sanitary paper web having high bulk, bulk softness and surface softness and method of manufacturing said web. 4,619,734, Cl. 162-111.000.
Ando, Toshihiko: *See—*
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, to Sumitomo Heavy Industries, Ltd.; and Sumitomo Metal Industries, Ltd. Supporting and guiding apparatus continuous rounds casting. 4,619,310, Cl. 164-448.000.
Andre, Wolfram K., to Kurt Wolf & Co. KG. Device for regulating the cooking process in a cooking vessel. 4,620,083, Cl. 219-491.000.
Andreas Stihl: *See—*
Mayer, Gunter, 4,619,045, Cl. 30-216.000.
Andrews, Ross E.: *See—*
Persson, John A.; Andrews, Ross E.; and Maola, Michael A., 4,620,308, Cl. 373-105.000.
Andrews, Steven L.: *See—*
Stall, Joe C.; Andrews, Steven L.; and Curnutt, Donald D., 4,619,771, Cl. 210-788.000.
Angrick, Michael; and Spath, Martin-Willi, to Kulzer & Co. GmbH. Isolating agent. 4,619,701, Cl. 106-38.230.
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, to Lohmann GmbH & Co. KG. Foil- or film-like bandage and process for using the same. 4,619,253, Cl. 218-156.000.
Anker Gram & Associates Ltd.: *See—*
Bedford, Timothy J.; and O'Sullivan, Paul J., 4,619,240, Cl. 123-575.000.
Ankri, David: *See—*
Scavennec, Andre ; and Ankri, David, 4,620,210, Cl. 357-30.000.
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Topert, Michael, to Schering Aktiengesellschaft. 6α, 16α-dimethyl corticoids. 4,619,922, Cl. 514-180.000.
Anner, Georg: *See—*
Kalvoda, Jaroslav; and Anner, Georg, 4,619,921, Cl. 514-180.000.
Anthony, Dennis R. Methods and apparati for generating optical mattes. 4,619,507, Cl. 352-46.000.
Antier, Patrick: *See—*
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,619,762, Cl. 210-170.000.
Antonia Products, Inc.: *See—*
Broussard, Ronney L., 4,619,298, Cl. 141-384.000.
Anzawa, Haruyoshi; Satoh, Kenji; Tanaka, Yoshinari; and Okaya, Takuji, to Kuraray Co., Ltd. Container superior in crack resistance. 4,619,849, Cl. 428-35.000.
Aono, Toshiaki; Nakamura, Koichi; and Nakamura, Taku, to Fuji Photo Film Co., Ltd. Dye fixing material. 4,619,883, Cl. 430-203.000.
Aoshima, Chikara; and Nagata, Toru, to Canon Kabushiki Kaisha. Film winding device for camera. 4,619,509, Cl. 354-173.100.
Appels, Johannes A.: *See—*
Maas, Henricus G. R.; Slotboom, Jan W.; Appels, Johannes A.; and Osinski, Kazimierz, 4,619,039, Cl. 29-591.000.
Appleton, Arthur I., to Appleton Electric Co. Fully grounded, corrosion resistant electrical enclosure. 4,620,061, Cl. 174-51.000.
Appleton Electric Co.: *See—*
Appleton, Arthur I., 4,620,061, Cl. 174-51.000.
Aprica Kassai Kabushikikaisha: *See—*
Kassai, Kenzou, 4,619,542, Cl. 403-62.000.
APX Group, Inc.: *See—*
Harwood, Jon W., 4,619,292, Cl. 138-113.000.
Arakawa, Isao: *See—*
Kozono, Haruo; and Arakawa, Isao, 4,619,472, Cl. 285-334.000.
Araki, Yoshiharu: *See—*
Motoyama, Kichizo; and Araki, Yoshiharu, 4,619,480, Cl. 296-217.000.
Arata, Yoshiaki; and Kobayashi, Akira, to Nippon Steel Corporation. Plasma jet generating apparatus with plasma confining vortex generator. 4,620,080, Cl. 219-121.0PP.
Araya, Junji, to Canon Kabushiki Kaisha. Variable magnification electrophotographic copying apparatus. 4,619,520, Cl. 355-14.00R.
Araya, Kotaro: *See—*
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, to Hitachi, Ltd. Method of manufacturing ultra-fine particles. 4,619,691, Cl. 75-0.50B.
Arikawa, Yoshijiro: *See—*
Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.
Armell, Richard A.; and Scott, Andrew, to Drexel Equipment (UK) Limited. Centralizing devices for use down-well. 4,619,322, Cl. 166-241.000.
Armitage, David, to United States of America, Air Force. Charge isolation in a spatial light modulator. 4,619,501, Cl. 350-386.000.
Armstrong World Industries, Inc.: *See—*
Brown, David S.; Forry, John S.; Mentzer, Nancy E.; and Misselhorn, Donald J., 4,619,860, Cl. 428-213.000.
Arnould, Jacques; and Tonnel, Eugene, to Thomson-CSF. Deep-grid semiconductor device. 4,620,213, Cl. 357-55.000.
Arrow Fastener Company, Inc.: *See—*
Knispel, Barry; and Wingert, Rudolf, 4,619,394, Cl. 227-156.000.
Asahi Glass Company Limited: *See—*
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,619,983, Cl. 526-247.000.
Asahi Kasei Kogyo Kabushiki Kaisha: *See—*
Yoshimura, Isao; and Hata, Hideo, 4,619,859, Cl. 428-213.000.
Asahi Kogaku Kogyo Kabushiki Kaisha: *See—*
Hara, Masato, 4,620,092, Cl. 250-231.0SE.
Asahi Medical Co., Ltd.: *See—*
Nose , Yukihiko; and Malchesky, Paul S., 4,619,639, Cl. 604-6.000.
Asai, Takeshi: *See—*
Sainen, Tsutomu; and Asai, Takeshi, 4,619,294, Cl. 139-99.000.
Asbury, Robert L., to Bell Helmets Inc. Insulated helmet. 4,619,003, Cl. 2-5.000.
Asea Aktiebolag: *See—*
Alvin, Kjell; and Hakansson, Kurt, 4,620,156, Cl. 324-424.000.
Asea Stal AB: *See—*
Brannstrom, Roine, 4,619,562, Cl. 406-182.000.
Astra Lakemedel Aktiebolag: *See—*
Ratti, Luigi, 4,619,785, Cl. 540-318.000.
AT&T Bell Laboratories: *See—*
Barber, Frank E., 4,620,118, Cl. 307-518.000.
Bushnell, William J.; Hemmeter, Richard W.; and Raghavan, Palanichamy, 4,620,066, Cl. 179-27.00D.
Gordon, Eugene I.; and Levy, Uri, 4,620,132, Cl. 315-3.000.
AT&T Technologies, Inc.: *See—*
Moss, Parry A.; and Rotoloni, Francis A., 4,619,842, Cl. 427-163.000.
Atanassova, Yordanka R.: *See—*
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.
Atlantic Richfield Co.: *See—*
Kolecki, Ronald E., 4,619,126, Cl. 72-38.000.
Lowther, Frank E., 4,619,225, Cl. 123-3.000.
Atlas Copco Aktiebolag: *See—*
Juan, Hans; Bjerngren, Jan Å.; and Stromdahl, Carl Å., 4,619,551, Cl. 404-90.000.
ATOCHEM: *See—*
Cognion, Jean-Marie; and Durual, Pierre, 4,620,050, Cl. 585-640.000.
Tatin, Gerard, 4,619,663, Cl. 8-107.000.
Auburn International, Inc.: *See—*
Girgenti, Russell S., 4,619,145, Cl. 73-861.040.
Audi, Josef: *See—*
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, 4,619,683, Cl. 65-351.000.
August, Rudolf R.: *See—*
Barkhoudarian, Sarkis; August, Rudolf R.; and Maram, Jonathan M., 4,620,093, Cl. 250-231.00P.
Auslander, David M.; Tomizuka, Masayoshi; Sagues, Paul; Ishida, Takashi; and Kamiyama, Shuichi. Engine cold starting. 4,619,237, Cl. 123-491.000.
Autoflug GmbH: *See—*
Butenop, Klaus, 4,619,418, Cl. 242-107.40A.
Autoliv GmbH: *See—*
Essler, Karl H., 4,619,419, Cl. 242-107.40A.
Autry Industries, Inc.: *See—*
Lin, Mark Y.; and Autry, James C., 4,619,056, Cl. 36-43.000.
Autry, James C.: *See—*
Lin, Mark Y.; and Autry, James C., 4,619,056, Cl. 36-43.000.
Avco Everett Research Laboratory, Inc.: *See—*
Flusberg, Allen M., 4,620,305, Cl. 372-37.000.
Avery International Corporation: *See—*
Sasaki, Yukihiko; Lin, Kenneth S.; and Patterson, Dianne L., 4,619,851, Cl. 428-40.000.
Awata, Yasuhira; and Iwaki, Osamu, to Oji Paper Company, Ltd. Process for preparation of porous carbon plates. 4,619,796, Cl. 264-29.400.

Axelson, Inc.: *See—*
Snyder, David E.; and Bruton, Billy R., 4,619,434, Cl. 251-14.000.
Axelsson, Robert. Prosthesis foot. 4,619,661, Cl. 623-55.000.
Ayers, Jack D.; and Anderson, Iver E., to United States of America, Navy. Method for generating fine sprays of molten metal for spray coating and powder making. 4,619,845, Cl. 427-422.000.
Azzola, Roberto; and Carrera, Luciano, to S.A.I.A.G. S.p.A. Weather strip for motor vehicle bodies and an extrusion head for making the strip. 4,619,077, Cl. 49-497.000.
B. F. Goodrich Company, The: *See—*
Dodge, James S., 4,619,960, Cl. 524-245.000.
Baba, Tadashi; and Kaneko, Norimasa, to Nakanishi Dental Mfg. Co., Ltd. Rotational coupling device for a dental handpiece having a built-in battery. 4,619,614, Cl. 433-99.000.
Baba, Takaaki; and O'Keefe, Gerald T., to Matsushita Electric Industrial Co., Ltd. Digital color TV camera. 4,620,222, Cl. 358-48.000.
Baba, Toru, to Kioritz Corporation. Mowing apparatus. 4,619,105, Cl. 56-12.700.
Babcock-Hitachi Kabushiki Kaisha: *See—*
Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.
Babcock & Wilcox Company, The: *See—*
Schluderberg, Donald C., 4,619,809, Cl. 376-402.000.
Baber, Samuel C.: *See—*
Havemann, Robert H.; and Baber, Samuel C., 4,619,036, Cl. 29-577.00C.
Bachmann, Herbert; and Hornung, Karl-Otto, to Stopinc Aktiengesellschaft. Arrangement for preventing air from reaching abutting sliding surfaces of rotary sliding closure unit. 4,619,444, Cl. 266-236.000.
Backx, Leo J. J.: *See—*
Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., 4,619,931, Cl. 514-252.000.
Bacrania, Kanti: *See—*
Cooper, Frank R.; and Bacrania, Kanti, 4,620,179, Cl. 340-347.0AD.
Badger Pharmacal, Inc.: *See—*
Kuenn, Cary K.; Young, Jean M.; and Wundrock, John A., 4,619,710, Cl. 134-22.170.
Bagalini, Dante, to Westinghouse Electric Corp. Molded case circuit breaker with resettable combined undervoltage and manual trip mechanism. 4,620,171, Cl. 335-20.000.
Bagby, John P., to Hughes Aircraft Company. Mirror focussing system with narrow viewing angle. 4,619,502, Cl. 350-505.000.
Bai, Chao-Liang. Catheter. 4,619,643, Cl. 604-43.000.
Bailey, James R. Support member for apertured supporting surfaces. 4,619,428, Cl. 248-221.200.
Bailey, Marcus J.: *See—*
Walker, Landis C.; and Bailey, Marcus J., 4,619,554, Cl. 405-120.000.
Bains, James A., Jr., to AMF Tuboscope, Inc. Lift-off compensation of eddy current probes by translating without rotation the X-Y coordinate plot of the complex locus of the probe output. 4,620,152, Cl. 324-225.000.
Baird Corporation: *See—*
Davison, Arthur L.; Blackburn, Martin D.; and Sellek, Donald A., 4,620,148, Cl. 324-99.00D.
Bakken, Kirby L.; Judson, Robert G.; Miller, William E.; and Peterson, Ronald A., to International Business Machines Corporation. Disk drive incremental rewrite. 4,620,243, Cl. 360-77.000.
Balch, Richard A.: *See—*
Germer, Warren R.; and Balch, Richard A., 4,620,150, Cl. 324-103.00R.
Baliga, Bantval J.; Temple, Victor A. K.; and Chow, Tat-Sing P., to General Electric Company. Method of reducing the current gain of an inherent bipolar transistor in an insulated-gate semiconductor device and resulting devices. 4,620,211, Cl. 357-38.000.
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela. Pharmaceutical compositions having appetite reducing activity and a process for their preparation. 4,619,936, Cl. 514-282.000.
Balken, Jochen; Beigang, Wolfgang; and Bihr, Bernhard, to Uni-Cardan Aktiengesellschaft. Fluidic shaft coupling assembly. 4,619,627, Cl. 464-24.000.
Balzer, Norbert R.; and Soworowski, David R., to Park-Ohio Industries, Inc. Heating magnetic metal workpieces. 4,619,717, Cl. 148-112.000.
Balzers Aktiengesellschaft: *See—*
Moll, Eberhard; Pulker, Hans K.; and Haag, Walter, 4,619,748, Cl. 204-192.310.
Banko, William: *See—*
Teodorescu, Tonel E.; and Banko, William, 4,619,146, Cl. 73-861.540.
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, to Otsuka Pharmaceutical Co., Ltd. Novel carbostyril derivatives, process for producing thereof and pharmaceutical composition containing the same. 4,619,932, Cl. 514-253.000.
Barber, Frank E., to AT&T Bell Laboratories. Dual port access circuit with automatic asynchronous contention resolving capability. 4,620,118, Cl. 307-518.000.
Barber, James C., to James C. Barber and Associates, Inc. Phosphoric acid composition. 4,619,819, Cl. 423-317.000.
Barber, Ronald L.: *See—*
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., 4,619,979, Cl. 526-88.000.
Bard, William B.: *See—*
Webb, Don W.; and Bard, William B., 4,619,901, Cl. 436-55.000.
Barkhoudarian, Sarkis; August, Rudolf R.; and Maram, Jonathan M., to Rockwell International Corporation. Optical pressure sensor. 4,620,093, Cl. 250-231.00P.
Barkow, William H.: *See—*
Morrell, Albert M.; Hughes, Richard H.; and Barkow, William H., 4,620,133, Cl. 315-15.000.
Barnes, James M.: *See—*
Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Barnes, James M., 4,619,985, Cl. 528-49.000.
Barnett, Ronald E.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,782, Cl. 560-122.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,834, Cl. 426-548.000.
Barr, Tery L.: *See—*
Lambert, Susan L.; Lawson, Randy J.; Johnson, Russell W.; and Barr, Tery L., 4,619,906, Cl. 502-66.000.
Barry, Raymond A.: *See—*
Squires, David G.; Hundley, Lloyd; and Barry, Raymond A., 4,619,706, Cl. 134-2.000.
Bartl, Herbert: *See—*
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,620,021, Cl. 556-19.000.
Bartos, Dezzo S.; and Fitzpatrick, Denis, to Harcourt House. Process for carrying out serological investigations according to the principle of the complement fixation test, and test packages for use in this process. 4,619,903, Cl. 436-517.000.
Baruffa, Olindo; and Jimenez, Antonio, to Mefina, S.A. Sewing machine with cam-controlled needle bar and feed dog. 4,619,214, Cl. 112-459.000.
BASF Aktiengesellschaft: *See—*
Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, 4,619,992, Cl. 534-733.000.
Krabetz, Richard; and Engelbach, Heinz, 4,620,035, Cl. 562-534.000.
Kummer, Rudolf; and Schwirten, Kurt, 4,619,790, Cl. 260-413.000.
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.
Schoettle, Klaus, 4,619,420, Cl. 242-198.000.
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.
Bass, Sidney: *See—*
Seki, Yoshizo; and Bass, Sidney, 4,619,625, Cl. 446-89.000.
Battelle Memorial Institute: *See—*
Porta, Augusto; and Kulhanek, Antonin, 4,619,745, Cl. 204-151.000.
Stambaugh, Edgel P.; Adair, James H.; Sekercioglu, Ibrahim; and Wills, Roger R., 4,619,817, Cl. 423-266.000.
Battiston, Joseph, to Tubular Fabricators Industry, Inc. Clamps for invalid walker to enhance structural integrity. 4,619,282, Cl. 135-67.000.
Bauck, Randall C.; and Kleczkowski, Peter S., to Iomega Corporation. Symmetrical coil actuator for a magnetic disk drive. 4,620,252, Cl. 360-106.000.
Baumann, Richard R.; and Eldridge, Richard I. Fiber-optic light system for movie projectors. 4,620,266, Cl. 362-32.000.
Baumann, Werner, to Sandoz Ltd. Azo compounds having a 2,4-dinitro-5-thiocyanophenyl diazo component radical. 4,619,993, Cl. 534-735.000.
Baumgartner, Ehrenfried: *See—*
Schroeder, Gunter; and Baumgartner, Ehrenfried, 4,620,029, Cl. 560-204.000.
Bayer Aktiengesellschaft: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,619,940, Cl. 514-383.000.
Findeisen, Kurt; and Fauss, Rudolf, 4,620,022, Cl. 556-417.000.
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,620,007, Cl. 546-156.000.
Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Barnes, James M., 4,619,985, Cl. 528-49.000.
Marhold, Albrecht; and Klauke, Erich, 4,620,018, Cl. 549-362.000.
Maurer, Fritz; and Homeyer, Bernhard, 4,619,918, Cl. 514-93.000.
Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, 4,619,966, Cl. 524-589.000.
Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, 4,620,021, Cl. 556-19.000.
BBC Brown, Boveri & Company Limited: *See—*
Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, 4,619,753, Cl. 204-290.00F.
Beck, Lawrence J.: *See—*
Schmidt, Gregory E.; Leung, Linus K.; Beck, Lawrence J.; and Chang, David S., 4,620,049, Cl. 585-501.000.
Becker, Reinhard: *See—*
Henning, Rainer; Urbach, Hansjorg; Teetz, Volker; and Becker, Reinhard, 4,620,012, Cl. 548-411.000.
Bedford, Timothy J.; and O'Sullivan, Paul J., to Anker Gram & Associates Ltd. Fuel oil injection engine. 4,619,240, Cl. 123-575.000.

Beelaard, Wilhelmus A. J.; and de Volder, Johannes A. P., to U.S. Philips Corporation. Deflection unit for a color television display tube. 4,620,174, Cl. 335-212.000.

Behrend, Lothar; Ober, Jurgen; Knothe, Erich; and Melcher, Franz-Josef, to Sartorius GmbH. Electric balance with scale on top. 4,619,337, Cl. 177-210.00R.

Behun, Eugene, to Xerox Corporation. Multicolor ink jet printhead. 4,620,198, Cl. 346-75.000.

Beigang, Wolfgang: *See—*
Balken, Jochen; Beigang, Wolfgang; and Bihr, Bernhard, 4,619,627, Cl. 464-24.000.

Bel Moratalla, Joaquin. Tunable antenna with variable series L–C network. 4,620,194, Cl. 343-747.000.

Bell, Frank H., to Morton Thiokol, Inc. Impact ignition device for a plurality of stab type primers. 4,619,200, Cl. 102-275.000.

Bell Helmets Inc.: *See—*
Asbury, Robert L., 4,619,003, Cl. 2-5.000.

Bellmer, Klaus: *See—*
Herbert, Adolf; Bellmer, Klaus; and Trocha, Jobst, 4,619,599, Cl. 425-186.000.

Bellon, Jean-Louis: *See—*
Mizzi, Francois; and Bellon, Jean-Louis, 4,620,062, Cl. 178-18.000.

Beloit Corporation: *See—*
Kirchner, Edward C.; and DeFoe, Ronald J., 4,619,414, Cl. 241-261.300.

Bender, Fredrick L. Pumping system having a main pump and a plurality of selectively operable subsidiary pumps. 4,619,592, Cl. 417-429.000.

Benelli Armi S.p.A.: *See—*
Benelli, Paolo, 4,619,183, Cl. 89-129.020.

Benelli, Paolo, to Benelli Armi S.p.A. Device for causing a firearm to fire in controlled bursts. 4,619,183, Cl. 89-129.020.

Berdelle-Hilge, Peter: *See—*
Heinzl, Joachim; Penningsfeld, Hans-Dieter; and Berdelle-Hilge, Peter, 4,620,201, Cl. 346-140.00R.

Berger, Fritz: *See—*
Vogel, Ernst; Berger, Fritz; and Stampfli, Armin, 4,619,497, Cl. 339-244.00R.

Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, to BASF Aktiengesellschaft. 3-(β-aminoethyl)-4-cyano-isothiazolylazo dyes. 4,619,992, Cl. 534-733.000.

Bernard, Bernie B., to O.I. Corporation. Total organic carbon analyzer. 4,619,902, Cl. 436-145.000.

Bero, Vernon L.: *See—*
Lutsey, Thomas H.; and Bero, Vernon L., 4,619,832, Cl. 426-302.000.

Bessard, Jean-Claude, deceased (by Bessard, Nadine, heir), to Swiss Aluminium Ltd. Cathode pot for an aluminum electrolytic cell. 4,619,750, Cl. 204-243.00R.

Bessard, Nadine, heir: *See—*
Bessard, Jean-Claude, deceased, 4,619,750, Cl. 204-243.00R.

Beugin, Michel P., to U.S. Philips Corporation. Device for rapidly mounting a base plate on a chassis. 4,619,432, Cl. 248-635.000.

Bevilacqua, Bruce W.: *See—*
Harman, Douglas G.; Green, Richard A.; and Bevilacqua, Bruce W., 4,619,128, Cl. 72-53.000.

Biehl, Roy J. Bulk food dispenser. 4,619,379, Cl. 222-153.000.

Biek, Paul A., to Dresser Industries, Inc. Control valve apparatus for pneumatic tools. 4,619,435, Cl. 251-25.000.

Bierwirth, Adolf P.: *See—*
Pehker, Manfred; Zielinski, Erich; Metz, Josef; and Bierwirth, Adolf P., 4,619,181, Cl. 89-34.000.

Biggar, John W.: *See—*
McIntyre, Brian W.; and Biggar, John W., 4,619,608, Cl. 423-220.000.

Bihr, Bernhard: *See—*
Balken, Jochen; Beigang, Wolfgang; and Bihr, Bernhard, 4,619,627, Cl. 464-24.000.

Bijma, Jan: *See—*
Peels, Antonius H. P. M.; van den Beld, Antonius J. M.; Bijma, Jan; and Gerritsen, Jan, 4,620,134, Cl. 315-15.000.

Billard, Jean: *See—*
Zimmermann, Herbert; Poupko, Raphi; Luz, Zeev; and Billard, Jean, 4,619,788, Cl. 260-410.500.

Binoeder, Peter P.; Whitacre, James B.; and Kunker, Don, to Burroughs Corporation. Programmable digital signal testing system. 4,620,302, Cl. 371-1.000.

BioResearch Inc.: *See—*
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,619,647, Cl. 604-318.000.

Bjerngren, Jan Å.: *See—*
Juan, Hans; Bjerngren, Jan Å.; and Stromdahl, Carl Å., 4,619,551, Cl. 404-90.000.

Black, James K.; and Black, Wesley F. Method and material for increasing viscosity and controlling of oil well drilling and work-over fluids. 4,619,772, Cl. 252-8.514.

Black, Wesley F.: *See—*
Black, James K.; and Black, Wesley F., 4,619,772, Cl. 252-8.514.

Blackburn, Martin D.: *See—*
Davison, Arthur L.; Blackburn, Martin D.; and Sellek, Donald A., 4,620,148, Cl. 324-99.00D.

Blake, John B. Clamping device. 4,619,447, Cl. 269-221.000.

Blake, William W.; and Coutant, Alan R., to Caterpillar Inc. Fluid control for two independent actuators. 4,619,187, Cl. 91-523.000.

Blakely, John P.: *See—*
McPherson, Hugh; and Blakely, John P., 4,620,112, Cl. 307-239.000.

Bland, Robert J., to Hewlett-Packard Company. Means providing independently controlled superimposed AC and DC voltages. 4,620,108, Cl. 307-2.000.

Blaser, Anton J.: *See—*
Potolsky, Abraham I.; and Blaser, Anton J., 4,619,640, Cl. 604-7.000.

Blickstein, Martin J., to Murata Erie N.A., Inc. Magnetically tunable dielectric resonator having a magnetically saturable shield. 4,620,169, Cl. 333-235.000.

Bloomer, Milton D., to General Electric Company. Circuit for self-commutated turn-off of latched devices, such as of the insulated-gate transistor/rectifier type. 4,620,258, Cl. 361-91.000.

Blyth, Randolph C.; Ucci, Pompelio A.; and McLellan, George R., to Monsanto Company. Easy-clean carpets which are stain resistant and water impervious. 4,619,853, Cl. 428-95.000.

BMD Badische Maschinenfabrik Durlach GmbH: *See—*
Muller, Gunter; and Damm, Norbert, 4,619,307, Cl. 164-169.000.

Board of Regents, The University of Texas System: *See—*
Linner, John G.; and Goosey, John D., 4,619,257, Cl. 128-303.100.

Boden, Richard M.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,619,780, Cl. 252-522.00R.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,620,041, Cl. 568-665.000.

Boeing Company, The: *See—*
Snyder, Howard E., 4,619,580, Cl. 415-12.000.
Spiger, Robert J., 4,620,230, Cl. 358-201.000.

Bogren, Ingemar S. B. Method and apparatus for manufacturing container having bellows bottom and lid. 4,619,636, Cl. 493-109.000.

Bohm, Jurgen; and Schad, Charles A., to Bopp & Reuther GmbH. Testing device for flow meters. 4,619,134, Cl. 73-3.000.

Bolduc, Leonard, to Hydro-Quebec. Self-controlled variable inductor with air gaps. 4,620,144, Cl. 323-331.000.

Bolenbaugh, Daniel L.: *See—*
Schreiner, Peter J.; Bolenbaugh, Daniel L.; and Krebs, David R., 4,619,347, Cl. 188-72.600.

Bolger, Thomas V., to RCA Corporation. Digital vertical beam landing correction circuit. 4,620,136, Cl. 315-371.000.

Bolliger, Martin: *See—*
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,619,309, Cl. 164-430.000.

Bonczar, Lawrence J.: *See—*
Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., 4,619,211, Cl. 112-132.000.

Bond, Larry O.: *See—*
Ross, Danny E.; and Bond, Larry O., 4,619,275, Cl. 128-783.000.

Bonfert, Heinrich: *See—*
Schmid, Karlheinz; and Bonfert, Heinrich, 4,619,565, Cl. 409-135.000.

Bonzer, William J.; and Scott, Gary L., to Fisher Controls International, Inc. Control regulator having a fabric reinforced diaphragm. 4,619,436, Cl. 251-61.100.

Boon, John R.: *See—*
Simpson, Sharon M.; McQuade, John M.; and Boon, John R., 4,619,892, Cl. 430-505.000.

Boorman, Roy S.: *See—*
Salter, Robert S.; Boorman, Roy S.; and Wilkomirsky, Igor A. E., 4,619,814, Cl. 423-27.000.

Boothroyd, Donald C.; and Norman, Robert W., Jr., to Honeywell Information Systems Inc. Data available indicator for an exhausted operand string. 4,620,274, Cl. 364-200.000.

Bopp & Reuther GmbH: *See—*
Bohm, Jurgen; and Schad, Charles A., 4,619,134, Cl. 73-3.000.

Borsenberger, Paul M., to Eastman Kodak Company. Low field electrophotographic process. 4,619,877, Cl. 430-31.000.

Boshear, Jerry A.: *See—*
Levin, Michael M.; and Boshear, Jerry A., 4,620,227, Cl. 358-147.000.

Boston, Ernest B., to Phillips Petroleum Company. Method and apparatus for recovering a fluid from a filter. 4,619,770, Cl. 210-772.000.

Botev, Botyo P.: *See—*
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.

Bothner, Carl R., to Eastman Kodak Company. Flexible sheet cleaning apparatus and method. 4,619,708, Cl. 134-6.000.

Botimer, Donald W. Tool support assembly. 4,619,566, Cl. 409-232.000.

Bott, Helmuth, to Dr. Ing. h.c.F. Porsche, Aktiengesellschaft. Arrangement of a pressure-measuring element. 4,619,137, Cl. 73-146.500.

Bowers, Kerry W.: *See—*
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,619,758, Cl. 208-85.000.

Bowmaker, Graham: *See—*
Schmidbaur, Hubert; Dorzbach, Cornelia; and Bowmaker, Graham, 4,620,020, Cl. 556-18.000.

Boyce, N. Blake; and McSpadden, J. Neil, to Universal Plastics, Inc. Pallet made from sheet of rigid material. 4,619,207, Cl. 108-51.100.

Boyer, Richard; and Diquet, Joel, to Manufacture de Machines due Haut-Rhin. Method of and apparatus for weighing doses of powder. 4,619,336, Cl. 177-1.000.

Bozler, Carl O.; Ehrlich, Daniel J.; and Tsao, Jeffrey Y., to Massachusetts Institute of Technology. Solid-transformation thermal resist. 4,619,894, Cl. 430-942.000.

Braatvedt, Ian H., to Compagnie Internationale des Pieux Armies Frankignoul. Apparatus for producing in-situ concreted piles with enlarged bases. 4,619,558, Cl. 405-237.000.

Brandes, Wilhelm: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,619,940, Cl. 514-383.000.

Brandstrom, Arne E.; and Lamm, Bo R., to Aktiebolaget Hassle. Processes for the preparation of omeprazole and intermediates therefore. 4,620,008, Cl. 546-271.000.

Brandt, Lennart, to AB Volvo Penta. Double propeller drive for boats. 4,619,584, Cl. 416-129.000.

Brann, Strother H.: *See—*
Kelly, Dean A.; and Brann, Strother H., 4,619,365, Cl. 206-503.000.

Brannstrom, Roine, to Asea Stal AB. Pneumatic transportation system for powdered or granular material with a switching valve for selection of different transport paths. 4,619,562, Cl. 406-182.000.

Braun, Dieter, to Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung. Vibration isolator. 4,619,349, Cl. 188-380.000.

Braun, Robert L.: *See—*
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,619,738, Cl. 202-85.000.

Bresee, Randall R.; and Reagan, Barbara M., to Kansas State University Research Foundation. Method of improving the abrasion resistance of recycled wool. 4,619,664, Cl. 8-128.00A.

Bresson, Clarence R.: *See—*
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,619,760, Cl. 209-166.000.

Breuning, Richard W.: *See—*
Thompson, Robert A.; and Breuning, Richard W., 4,620,281, Cl. 364-475.000.

Bridgestone Corporation: *See—*
Tokunaga, Seiichiro; and Ikeda, Nobumasa, 4,619,300, Cl. 152-209.00R.

Brink, Fredericus J., to Ingenieursbureau Het Noorden B.V. Laminating apparatus. 4,619,728, Cl. 156-555.000.

Bristol-Myers Company: *See—*
Hoshi, Hideaki; and Naito, Takayuki, 4,619,925, Cl. 514-200.000.
New, James S.; Lobeck, Walter G., Jr.; and Yevich, Joseph P., 4,619,930, Cl. 514-252.000.

Brockhaus, Ernst, to ED. Scharwachter GmbH & Co. KG. Hinge attachment arrangement for an adjustable, detachable attachment of motor vehicle doors. 4,619,016, Cl. 16-383.000.

Broger, Emil A.; and Crameri, Yvo, to Hoffmann-La Roche Inc. Chiral phosphines. 4,620,013, Cl. 548-412.000.

Brooks, Robert B., to General Electric Company. Ice dispenser for a household refrigerator. 4,619,380, Cl. 222-240.000.

Brooks, Robert E.; and Penunuri, David, to TRW Inc. Surface acoustic wave systems and methods. 4,620,167, Cl. 333-195.000.

Brother Industries, Ltd.: *See—*
Tani, Zempei; Ebina, Kiyoshi; Ichikawa, Osamu; and Imaizumi, Mamoru, 4,620,094, Cl. 250-231.0SE.

Broussard, Ronney L., to Antonia Products, Inc. Cable greasing adaptor. 4,619,298, Cl. 141-384.000.

Brown, Andrew V., to Advanced Micro Devices, Inc. Polymerizable planarization layer for integrated circuit structures. 4,619,837, Cl. 427-44.000.

Brown, David S.; Forry, John S.; Mentzer, Nancy E.; and Misselhorn, Donald J., to Armstrong World Industries, Inc. Foamed phosphate tile products. 4,619,860, Cl. 428-213.000.

Brown, Dennis M.: *See—*
Luck, Edward E.; and Brown, Dennis M., 4,619,913, Cl. 514-2.000.

Brown, Irving J. Automatic mitering apparatus. 4,619,163, Cl. 83-82.000.

Brown, William R.: *See—*
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.

Browning, Shane C.: *See—*
Smeed, Clement G.; and Browning, Shane C., 4,619,278, Cl. 131-284.000.

Brudi Equipment Co.: *See—*
Frison, Emmett, 4,619,579, Cl. 414-607.000.

Bruedwill, Inc.: *See—*
Markowitz, Harry, 4,619,120, Cl. 66-192.000.

Bruggema, Donald J.: *See—*
Schnell, Robert P.; Sampson, Robert W.; Pacanowski, Ronald F.; and Bruggema, Donald J., 4,620,284, Cl. 364-498.000.

Brush, Robert W., Jr., to Thomas & Betts Corporation. Flat cable connector with grounding clip. 4,619,487, Cl. 339-14.00R.

Bruton, Billy R.: *See—*
Snyder, David E.; and Bruton, Billy R., 4,619,434, Cl. 251-14.000.

Bryan, Lannie R.; and Schultz, Gary R., to Eaton Corporation. Vehicle air system including central tire inflation system. 4,619,303, Cl. 152-416.000.

BSR North America, Ltd.: *See—*
Smith, Kobert R., II, 4,620,254, Cl. 360-132.000.

Buchel, Karl H.: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,619,940, Cl. 514-383.000.

Buck, Marshall D., to Cerwin-Vega, Inc. Multiple sound transducer system utilizing an acoustic filter to reduce distortion. 4,619,342, Cl. 181-184.000.

Buechel, Frederick F.: *See—*
Pappas, Michael J.; and Buechel, Frederick F., 4,619,658, Cl. 623-22.000.

Buhler, Niklaus: *See—*
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,619,838, Cl. 427-53.100.

Buhr, Gerhard, to Hoechst Aktiengesellschaft. Light-sensitive triazines possessing trichloromethyl groups. 4,619,998, Cl. 544-193.100.

Builders Equipment and Tool Manufacturing Company: *See—*
Gilbreth, William E., 4,619,549, Cl. 403-349.000.

Bull, Robert W.; Soltysiak, Robert M.; and Minnick, Paul D., to Neogen Corporation. Method for administering equine vaccines and compositions therefor. 4,619,827, Cl. 424-89.000.

Burch, Homer A.; and Ebetino, Frank F., to Norwich Eaton Pharmaceuticals, Inc. Compositions for treating tumors. 4,619,928, Cl. 514-236.000.

Burger, Laurie J.; Helfer, Joel N.; Protzmann, Donald E.; and Uhl, Robert F., to Chesebrough-Pond's, Inc. Electronic thermometer with probe isolation chamber. 4,619,271, Cl. 128-736.000.

Burgoon, Jack L., to Cooper Industries, Inc. Scrubber with mechanism for automatically raising and lowering a squeegee assembly. 4,619,010, Cl. 15-50.00R.

Burroughs Corporation: *See—*
Binoeder, Peter P.; Whitacre, James B.; and Kunker, Don, 4,620,302, Cl. 371-1.000.

Burrowes, Sherwin D. D., to RCA Corporation. Apparatus for detecting a chrominance reference burst component to develop a burst gate pulse. 4,620,219, Cl. 358-20.000.

Burt, Harold S.: *See—*
Summa, Gareth D.; Reed, George K.; and Burt, Harold S., 4,619,575, Cl. 414-280.000.

Bushnell, William J.; Hemmeter, Richard W.; and Raghavan, Palanichamy, to AT&T Bell Laboratories. Method and apparatus for sharing operators among assistance systems. 4,620,066, Cl. 179-27.00D.

Butenop, Klaus, to Autoflug GmbH. Self-locking belt reel-in mechanism for safety belts. 4,619,418, Cl. 242-107.40A.

Butler, Donald E.; and L'Italien, Yvon J., to Warner-Lambert Company. Saturated bicyclic lactam acids and derivatives as cognition activators. 4,619,937, Cl. 514-323.000.

Butt, James A.; Mondal, Kalyan; and Roberts, Preston L., to Lehigh University. Programmable load controller. 4,620,283, Cl. 364-493.000.

Buttry, Daniel A.; Krounbi, Mohamad T.; and Melroy, Owen R., to International Business Machines Corporation. Process for etching via holes in alumina. 4,619,731, Cl. 156-644.000.

Buzzi & Co. S.A.: *See—*
Buzzi, Ugo, 4,619,130, Cl. 72-124.000.

Buzzi, Ugo, to Buzzi & Co. S.A. Apparatus for providing a rim on the tips of ballpoint. 4,619,130, Cl. 72-124.000.

C. van der Lely N.V.: *See—*
van der Lely, Cornelis, 4,619,106, Cl. 56-341.000.

Caber Italia S.p.A.: *See—*
Sartor, Leo; and Gobbo, Franco, 4,619,057, Cl. 36-50.000.

Caldwell, Roland B., to Ranco Incorporated. Elevation responsive automatic vehicle control system. 4,619,286, Cl. 137-81.100.

California Institute of Technology: *See—*
Margalit, Shlomo; Chiu, Liew-Chuang; Smith, John S.; and Yariv, Amnon, 4,620,214, Cl. 357-63.000.

Calviello, Joseph A., to Eaton Corporation. Edge channel FET. 4,620,207, Cl. 357-22.000.

Camara, Michael A.: *See—*
Steltenkamp, Robert J.; and Camara, Michael A., 4,619,775, Cl. 252-8.800.

Campbell, James H. Bit holder with impact release mechanism. 4,619,567, Cl. 409-234.000.

Can-Am Engineering Corporation: *See—*
Fishgal, Semyon L., 4,619,406, Cl. 241-5.000.

Canada, Her Majesty the Queen in right of: *See—*
Twardawa, Philip A.; and St-Onge, Michel C., 4,619,424, Cl. 244-151.00B.

Canon Kabushiki Kaisha: *See—*
Aoshima, Chikara; and Nagata, Toru, 4,619,509, Cl. 354-173.100.
Araya, Junji, 4,619,520, Cl. 355-14.00R.
Kiyohara, Shuichi, 4,619,512, Cl. 354-458.000.
Miyamoto, Kazuki, 4,619,521, Cl. 355-14.00R.

Capocci, Gerald A.: *See—*
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,619,957, Cl. 524-91.000.

Card, Joseph L.: *See—*
Card, Roy T.; and Card, Joseph L., 4,619,212, Cl. 112-266.200.

Card, Roy T.; and Card, Joseph L. Tufting machine and method of tufting for producing multiple rows of tufts with single lengths of yarn. 4,619,212, Cl. 112-266.200.

Carl-Zeiss-Stiftung: *See—*
Daniels, Erwin J.; Kratzer, Bernd; and Schurle, Hermann, 4,619,504, Cl. 351-163.000.

Carlson, Walter H., to Graphite Sales, Inc. Method and material for plugging an ingot mold. 4,619,950, Cl. 523-140.000.

Carlton, Stephen C., to Northern Telecom Limited. Serial-to-parallel converter for high-speed bit streams. 4,620,180, Cl. 340-347.0DD.

Carrera, Luciano: *See—*
Azzola, Roberto; and Carrera, Luciano, 4,619,077, Cl. 49-497.000.

Carrier Corporation: *See—*
Chu, Tsuwei; and Pandeya, Prakash N., 4,619,118, Cl. 62-324.100.
McManus, John R.; and Ubowski, Lawrence W., 4,619,024, Cl. 29-157.30R.
McManus, John R.; and Wright, William E., 4,619,025, Cl. 29-157.30R.
Pickering, Mark A., 4,619,604, Cl. 431-353.000.

Carriere, Richard T.: *See—*
Jalbing, John I.; and Carriere, Richard T., 4,619,912, Cl. 502-439.000.

Carroll, Michael W.; and Harwood, Michael E., to North American Agricultural, Inc. Grain bin floor and method of making same. 4,619,085, Cl. 52-192.000.

Carstensen, Kenneth J. Heat recoverable locking device. 4,619,568, Cl. 411-222.000.

Carter-Wallace, Inc.: *See—*
Stiefel, Frank J., 4,620,015, Cl. 548-547.000.

Carter, William C., to Marley Cooling Tower Company, The. Externally controlled variable pitch fan hub assembly. 4,619,586, Cl. 416-157.00R.

Cartwright, Timothy B.: *See—*
Clay, David T.; and Cartwright, Timothy B., 4,619,732, Cl. 162-29.000.

Casio Computer Co., Ltd.: *See—*
Kameyama, Kazuhiro; and Akiba, Nobuo, 4,619,518, Cl. 355-4.000.
Matsuzaki, Akio, 4,619,175, Cl. 84-1.010.

Casio Electronics Mfg. Co., Ltd.: *See—*
Kameyama, Kazuhiro; and Akiba, Nobuo, 4,619,518, Cl. 355-4.000.

Casket Shells, Inc.: *See—*
Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., 4,619,211, Cl. 112-132.000.

Castaldi, Graziano: *See—*
Uggeri, Fulvio; Castaldi, Graziano; and Giordano, Claudio, 4,620,031, Cl. 562-466.000.

Caterpillar Inc.: *See—*
Blake, William W.; and Coutant, Alan R., 4,619,187, Cl. 91-523.000.

Caulkins, Kenneth B. Musical instrument pneumatic actuator. 4,619,177, Cl. 84-50.000.

Cavagnis, Walter: *See—*
Magnoni, Pierangelo; Strada, Pier E.; Cavagnis, Walter; and Sanvito, Angelo, 4,619,006, Cl. 5-68.000.

CD High Technology, Inc.: *See—*
Jeppson, Morris R., 4,619,550, Cl. 404-80.000.

Celanese Corporation: *See—*
Doerr, Marvin L., 4,620,032, Cl. 562-483.000.

Celluloid S.A.: *See—*
Wachtel, Jean-Louis, 4,619,012, Cl. 15-187.000.

Central Glass Company, Limited: *See—*
Kawai, Toshikazu; Nishimura, Ysunobu; and Kanesaki, Katumi, 4,620,042, Cl. 568-775.000.

Central Sprinkler Corp.: *See—*
Pieczykolan, George S., 4,619,327, Cl. 169-38.000.

Ceresko, Helen: *See—*
Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., 4,619,211, Cl. 112-132.000.

Cerwin-Vega, Inc.: *See—*
Buck, Marshall D., 4,619,342, Cl. 181-184.000.

Cescon, Lawrence A.; and Trebilcock, Robert W., to Du Pont de Nemours, E. I., and Company. Emulsion-containing explosive compositions. 4,619,721, Cl. 149-21.000.

CGR Ultrasonic: *See—*
Lannuzel, Olivier; and Pradal, Thierry, 4,619,267, Cl. 128-660.000.

Chalk, Christine D.; and Hayman, Cecil, to IC Gas International Limited. Heat storage materials. 4,619,778, Cl. 252-70.000.

Champion International Corporation: *See—*
Platt, Sterling B., 4,619,299, Cl. 144-357.000.

Chan, Wan-Kit: *See—*
Loev, Bernard; and Chan, Wan-Kit, 4,619,945, Cl. 514-729.000.

Chang, Clarence D.; and Hellring, Stuart D., to Mobil Oil Corporation. Hydrolysis of olefin oxides to glycols. 4,620,044, Cl. 568-833.000.

Chang, Clarence D.; and Miale, Joseph N., to Mobil Oil Corporation. Acid-catalyzed xylene isomerization. 4,620,054, Cl. 585-481.000.

Chang, David S.: *See—*
Schmidt, Gregory E.; Leung, Linus K.; Beck, Lawrence J.; and Chang, David S., 4,620,049, Cl. 585-501.000.

Chang, Wei K.: *See—*
Gold, Elijah H.; and Chang, Wei K., 4,619,919, Cl. 514-166.000.

Charbonneau, Robert R.; Heilmann, Steven M.; Rasmussen, Jerald K.; and Tumey, Michael L., to Minnesota Mining and Manufacturing Company. Azlactone-containing pressure-sensitive adhesives. 4,619,867, Cl. 428-355.000.

Charlton, Thomas J., to Alltech Corporation. Decorative window product and process. 4,619,850, Cl. 428-38.000.

Chastain, David M.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Chatow, Yser. Method for producing fabric and garments. 4,619,724, Cl. 156-72.000.

Chauvel, Gerard, to Texas Instruments Incorporated. Video display system. 4,620,289, Cl. 364-521.000.

Check Mate Systems, Inc.: *See—*
Keifer, Terry A., 4,620,182, Cl. 340-568.000.

Chemische Werke Huls Aktiengesellschaft: *See—*
Gorke, Klaus; and Schoppen, Josef, 4,619,951, Cl. 523-173.000.

Chen, Sheng-Yi: *See—*
Pan, Yau-Jung; and Chen, Sheng-Yi, 4,619,124, Cl. 70-419.000.

Cheng, Chung-Ping; Iacobucci, Paul A.; and Walsh, Edward N., to Stauffer Chemical Company. Non-aged inorganic oxide-containing aerogels and their preparation. 4,619,908, Cl. 502-214.000.

Chesebrough-Pond's, Inc.: *See—*
Burger, Laurie J.; Helfer, Joel N.; Protzmann, Donald E.; and Uhl, Robert F., 4,619,271, Cl. 128-736.000.

Cheung, William S. H. Apparatus for producing audio and visual signals for modulating a television system carrier signal. 4,620,226, Cl. 358-143.000.

Chiu, Liew-Chuang: *See—*
Margalit, Shlomo; Chiu, Liew-Chuang; Smith, John S.; and Yariv, Amnon, 4,620,214, Cl. 357-63.000.

Chlystun, Walter K. Method for producing a dispensing container for pressurized fluids. 4,619,797, Cl. 264-40.100.

Choi, Won H. Key holder with changeable indicia display. 4,619,125, Cl. 70-460.000.

Chonan, Katsuhiko, to Mitsubishi Denki Kabushiki Kaisha. Control device for variable speed electric motor. 4,620,140, Cl. 318-332.000.

Chow, Tat-Sing P.: *See—*
Baliga, Bantval J.; Temple, Victor A. K.; and Chow, Tat-Sing P., 4,620,211, Cl. 357-38.000.

Chown, David P. M., to STC plc. Optical fibre receiver. 4,620,321, Cl. 455-619.000.

Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, to BBC Brown, Boveri & Company Limited. Bipolar plate for an apparatus with a stacked configuration, said apparatus comprised of a plurality of electrochemical cells with solid electrolyte; and method of manufacturing said plate. 4,619,753, Cl. 204-290.00F.

Christiansen, Jean E.; Fitzgerald, Maryanne; Moeller, Mitchell G.; Pascalides, Artemis; and Vayda, R. Thaddeus. Compressible rotational artificial joint. 4,619,660, Cl. 623-46.000.

Chu, Chia-Shih; and Wu, Chin-Lung. Printing or drawing mold for stockings. 4,619,384, Cl. 223-77.000.

Chu, Tsuwei; and Pandeya, Prakash N., to Carrier Corporation. Reversible compressor. 4,619,118, Cl. 62-324.100.

Chung, Kwong T.; and Triano, Alfred R., to RCA Corporation. Kinescope-yoke assembly. 4,620,127, Cl. 313-440.000.

Church, John F.; Stone, Walter H.; and Schaupp, Richard E., to Parker-Hannifin Corporation. Repelling-action filter unit and assembly. 4,619,764, Cl. 210-248.000.

Ciba-Geigy Corporation: *See—*
Eckert, Theodor, 4,619,926, Cl. 514-210.000.
Hauser, Helmut, 4,619,794, Cl. 264-4.100.
Kalvoda, Jaroslav; and Anner, Georg, 4,619,921, Cl. 514-180.000.
Lee, Ping I., 4,619,793, Cl. 264-2.600.
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,619,838, Cl. 427-53.100.
Mueller, Karl F., 4,619,974, Cl. 525-332.400.
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,619,957, Cl. 524-91.000.
Reid, William J., 4,619,978, Cl. 526-84.000.

Cibie, Pierre, to Cibie Projecteurs. Corrector device for automatically correcting the beam direction of vehicle headlamps to compensate for variations in vehicle trim. 4,620,267, Cl. 362-71.000.

Cibie Projecteurs: *See—*
Cibie, Pierre, 4,620,267, Cl. 362-71.000.

Cichy, Mitchell J.: *See—*
Stolar, Mike; Robertson, David B.; and Cichy, Mitchell J., 4,619,231, Cl. 123-333.000.

Cieciuch, Ronald F.: *See—*
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,619,784, Cl. 540-593.000.

Clantex Limited: *See—*
Houlbrook, Kenneth; and Thornton, Paul A., 4,619,382, Cl. 222-327.000.

Clarion Co., Ltd.: *See—*
Imagawa, Toshiyuki, 4,620,315, Cl. 381-10.000.

Clark, John W.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Clark, William J. Apparatus for the orthodontic treatment of teeth. 4,619,609, Cl. 433-6.000.

Clarke, John J., to Ferranti plc. Weapon aim-training apparatus. 4,619,616, Cl. 434-22.000.

Clay, David T.; and Cartwright, Timothy B., to Institute of Paper Chemistry, The. Method for drying pulping liquor to a burnable solid. 4,619,732, Cl. 162-29.000.

Cloeren, Peter. Die with combining adaptor insert and melt-lamination process. 4,619,802, Cl. 264-171.000.

Coffee, Ronald A., to Imperial Chemical Industries PLC. Valve. 4,619,438, Cl. 251-129.010.

Cogema, Compagnie Generale des Matieres Nucleaires: *See*—
Lorenzelli, Robert; Dabernard, Pierre; and Maire, Christian, 4,619,572, Cl. 414-217.000.

Cognion, Jean-Marie; and Durual, Pierre, to ATOCHEM. Process for the manufacture of ethylene from ethyl esters. 4,620,050, Cl. 585-640.000.

Cohen, Beri, to Technicon Instruments Corp. Method for preparing lipid vesicles. 4,619,795, Cl. 264-4.600.

Cole, Clayton K.: *See*—
Margolis, Frederick J.; and Cole, Clayton K., 4,619,270, Cl. 128-721.000.

Coleman, Harry E., IV. Surf riding air bag. 4,619,621, Cl. 441-66.000.

Colgate-Palmolive Company: *See*—
Eigen, Edward; and Simone, Alexander J., 4,619,825, Cl. 424-49.000.
Ramachandran, Pallassana N.; and Grand, Paul S., 4,619,774, Cl. 252-8.700.
Steltenkamp, Robert J.; and Camara, Michael A., 4,619,775, Cl. 252-8.800.

Colgate, Stirling A., to Colgate Thermodynamics Co. Stirling cycle machine. 4,619,112, Cl. 62-6.000.

Colgate Thermodynamics Co.: *See*—
Colgate, Stirling A., 4,619,112, Cl. 62-6.000.

Colic Machine & Tool Limited: *See*—
Valavaara, Viljo K., 4,619,166, Cl. 83-461.000.

Collins, John D., to Raytheon Company. Continuous wave radar with ranging capability. 4,620,192, Cl. 342-128.000.

Collonia, Harald, to VDO Adolf Schindling AG. Device for disconnecting the feed of fuel to an internal combustion engine. 4,619,230, Cl. 123-325.000.

Comabi S.A.: *See*—
Deguerry, Louis, 4,619,346, Cl. 187-9.00E.

Combustion Engineering, Inc.: *See*—
Formanek, Frank J., 4,619,808, Cl. 376-272.000.
Waryasz, Richard E., 4,619,315, Cl. 165-104.160.

Comeau, Paul E., to Kenney Manufacturing Company. Semi-adjustable shade and roller combination. 4,619,305, Cl. 160-263.000.

Communications Satellite Corp.: *See*—
Lee, Lin-nan; and Redman, Mark D., 4,620,224, Cl. 358-119.000.

Compagnie Internationale des Pieux Armes Frankignoul: *See*—
Braatvedt, Ian H., 4,619,558, Cl. 405-237.000.

Conklin, Barry C., to SI Handling Systems, Inc. Intelligent driverless vehicle. 4,620,280, Cl. 364-426.000.

Conlon, Edward J.: *See*—
Prabhu, Ashok N.; Conlon, Edward J.; and Sechi, Franco N., 4,619,836, Cl. 427-41.000.

Connaught Laboratories, Inc.: *See*—
Gordon, Lance K., 4,619,828, Cl. 424-92.000.

Conner, David E., to International Business Machines Corp. Transformer coupled, solid state communications line switch. 4,620,187, Cl. 340-825.050.

Conoco Inc.: *See*—
Salama, Mamdouh M.; Myers, Roderick J.; Thomason, William H.; and Joosten, Michael H., 4,619,557, Cl. 405-211.000.
Sylvest, Lawrence E., II, 4,619,475, Cl. 294-90.000.

Conradty GmbH & Co. Metallelektroden KG: *See*—
Koziol, Konrad; and Wenk, Erich, 4,619,752, Cl. 204-286.000.

Consortium fur Elektrochemische Industrie GmbH: *See*—
Kreuzer, Franz-Heinrich; and Gebauer, Helmut, 4,620,023, Cl. 556-460.000.

Constant, James. Transmission line dividers multipliers Fourier transformers and convolvers. 4,620,290, Cl. 364-578.000.

Contact Lens Supplies Limited: *See*—
Dent, Michael J.; and Handricks, Ian L., 4,619,082, Cl. 51-284.00R.

Contraves GmbH: *See*—
Eblen, Otto; Glockler, Gerhard; Kohler, Franz; and Meinusch, Norbert, 4,620,195, Cl. 346-1.100.

Cook, P. Dan; and McNamara, Dennis J., to Warner-Lambert Company. Process for preparing 2-β-D-ribofuranosylselenazole-4-carboxamide. 4,619,996, Cl. 536-55.300.

Cook, Randall W.; Rozporka, Richard E.; and Jones, Robert S., to Tandy Corporation. Tape cartridge static eliminator. 4,620,255, Cl. 360-132.000.

Cook, Ronald L., to Texaco Inc. Electrolytic method for reducing oxalic acid to a product. 4,619,743, Cl. 204-77.000.

Cook, Stephen F.; Fisher, Harland S.; and Kosciuczyk, Theodore E., to Westvaco Corporation. Label applicator. 4,619,726, Cl. 156-366.000.

Cooney, Robert W., to General Electric Company. Compact power supply module and cord. 4,620,110, Cl. 307-48.000.

Cooper, Brian F.: *See*—
Davis, Peter R.; Cooper, Brian F.; and Cottey, David H., 4,619,041, Cl. 29-600.000.

Cooper, Edward, to Power-Science, Inc. Method and system for recording and displaying input data signals. 4,620,149, Cl. 324-103.00P.

Cooper, Frank R.; and Bacrania, Kanti, to Harris Corporation. Method for successive approximation A/D conversion. 4,620,179, Cl. 340-347.0AD.

Cooper Industries, Inc.: *See*—
Burgoon, Jack L., 4,619,010, Cl. 15-50.00R.

Corblick, Robert F. Electrical connector with one-hand disconnect. 4,619,492, Cl. 339-45.00R.

Cornell, David D.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,620,055, Cl. 585-438.000.

Cottey, David H.: *See*—
Davis, Peter R.; Cooper, Brian F.; and Cottey, David H., 4,619,041, Cl. 29-600.000.

Couch, Donald G., to Hughes Tool Company. Wellhead connector locking mechanism. 4,619,324, Cl. 166-344.000.

Coulston, El L.: *See*—
Trummer, Joseph A.; and Coulston, El L., 4,619,097, Cl. 52-730.000.

Courier Display Systems Limited: *See*—
Smith, Michael T., 4,619,304, Cl. 160-135.000.

Coutant, Alan R.: *See*—
Blake, William W.; and Coutant, Alan R., 4,619,187, Cl. 91-523.000.

Cox, Everett L.: *See*—
Read, Randol R.; Cox, Everett L.; and Selzler, Randall L., 4,620,279, Cl. 364-200.000.

Cox, John D.: *See*—
Keates, Richard H.; Schneider, Richard T.; Roxey, Timothy E.; and Cox, John D., 4,619,657, Cl. 623-6.000.

Crameri, Yvo: *See*—
Broger, Emil A.; and Crameri, Yvo, 4,620,013, Cl. 548-412.000.

Crear, William, III; and Ahern, Roy E. Sailboat luff system. 4,619,216, Cl. 114-105.000.

Creissels, Denis. Drive system for a twin suspension haulage cable gondola lift. 4,619,206, Cl. 104-178.000.

Crew, Gerald W. Standing tree baler. 4,619,193, Cl. 100-13.000.

Crinnion, Edward V.; and Crinnion, James S. Structural module for retaining walls and the like. 4,619,560, Cl. 405-284.000.

Crinnion, James S.: *See*—
Crinnion, Edward V.; and Crinnion, James S., 4,619,560, Cl. 405-284.000.

Cristante, Guido, to I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomestici. Apparatus for making ice cream. 4,619,116, Cl. 62-233.000.

Croiset, Pierre, to Societe Nationale Industrielle Aerospatiale. Suspension and drive method and corresponding device for oscillating mirror in space telescope. 4,619,498, Cl. 350-6.600.

Crowe, Stephen O.; and Harper, Jeffrey D., to International Paper Company. L-shaped shipping container. 4,619,362, Cl. 206-326.000.

CTS Corporation: *See*—
Leung, Tommy Y.; and Waldron, Mark A., 4,620,294, Cl. 364-900.000.
Zdanys, John, Jr.; Zaderej, Tony J.; and Robbins, Matthew A., 4,620,077, Cl. 200-331.000.

Cubicciotti, Roger S.; Karu, Alexander E.; and Krauss, Ronald M., to University of California, The Regents of The. Lipoprotein marker for hypertriglyceridemia. 4,619,895, Cl. 435-7.000.

Cue, Berkeley W., Jr.; and Moore, Bernard S., to Pfizer Inc. S-6-fluoro-4-aminochroman-4-carboxylic acid derivatives useful as intermediates for sorbinil. 4,620,019, Cl. 549-404.000.

Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., to Multiform Desiccants, Inc. Adsorbent device. 4,619,673, Cl. 55-387.000.

Cummins Engine Company, Inc.: *See*—
Matheson, Charles L.; Lane, Preston D.; Dieringer, James V.; and Ambafz, Emilio, 4,619,677, Cl. 55-510.000.

Cunningham, Charles R.; and Godden, Glenn S., to General Electric Company. Aircraft thermostat. 4,620,084, Cl. 219-497.000.

Curnutt, Donald D.: *See*—
Stall, Joe C.; Andrews, Steven L.; and Curnutt, Donald D., 4,619,771, Cl. 210-788.000.

Curt G. Joa, Inc.: *See*—
Radzins, Edmund; and Kenney, Timothy J., 4,619,357, Cl. 198-412.000.

Cutler, Christopher A.; and Wallace, William D., to Utah Medical Products, Inc. Apparatus and method for monitoring respiratory gas. 4,619,269, Cl. 128-719.000.

Cyanamid Agricultural de Puerto Rico, Inc.: *See*—
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,620,009, Cl. 548-155.000.

Cybernetic Data Products: *See*—
Levin, Michael M.; and Boshear, Jerry A., 4,620,227, Cl. 358-147.000.

Cycyk, Michael A.; and Seitz, Robert R. Potato cutter. 4,619,192, Cl. 99-538.000.

Czopor, Edmund J., Jr., to Stanley Works, The. Display package for drill bits and the like. 4,619,364, Cl. 206-379.000.

Czupryna, Gary: *See*—
Natansohn, Samuel; and Czupryna, Gary, 4,619,905, Cl. 501-97.000.

D. Drukker & Zn. N.V.: *See*—
Doting, Jan, 4,619,563, Cl. 407-118.000.

D&K Custom Machine Design, Inc.: *See*—
King, Michael T., 4,619,169, Cl. 83-697.000.

Dabernard, Pierre: *See*—
Lorenzelli, Robert; Dabernard, Pierre; and Maire, Christian, 4,619,572, Cl. 414-217.000.

Dachniwskyj, Maryam L.: *See*—
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,619,051, Cl. 34-9.000.

Dacomed Corporation: *See*—
Helms, Richard A.; Timm, Gerald W.; and Sandford, Donald L., 4,619,251, Cl. 128-79.000.

D'Agostino, Philip L. Telephone wall caddy. 4,620,067, Cl. 179-146.00R.

Daicel Chemical Industries, Ltd.: *See*—
Okamoto, Yoshio; and Hatada, Koichi, 4,619,970, Cl. 525-100.000.
Shiga, Makoto; Miyazawa, Akira; and Miyutani, Mitsuyosi, 4,619,279, Cl. 131-345.000.
Yuki, Yoichi; and Ichida, Akito, 4,619,984, Cl. 528-38.000.

Daido Tokusyuko K.K.: *See*—
Kawanobe, Yasutaka; Noguti, Hisao; Kanou, Singi; and Yamazaki, Katsuya, 4,619,694, Cl. 75-59.140.

Daimler-Benz Aktiengesellschaft: *See*—
Kneib, Rudi; Emmer, Ludwig; and Robitschko, Peter, 4,619,477, Cl. 296-37.130.

Dainichi-Nippon Cables, Ltd.: *See*—
Mio, Kotaro; and Ijiri, Yasuo, 4,619,852, Cl. 428-68.000.

Daly, Jeffery E.; and Kotch, Robert J., to Reed Tool Company. Roller cutter drill bit having a texturized seal member. 4,619,534, Cl. 384-94.000.

Dam, Erik; and Gronning, Erik. Adhesive paper material and a label made from such material. 4,619,858, Cl. 428-211.000.

D'Amato, Paolo; and Salvadorini, Rolando, to Rai-Radio Televisione Italiana. Method of transmitting and receiving color television signals on two channels for broadcasting from satellite and apparatus for carrying out said method. 4,620,218, Cl. 358-12.000.

Damm, Norbert: *See*—
Muller, Gunter; and Damm, Norbert, 4,619,307, Cl. 164-169.000.

Dammann, Karl-Heinz, to Technika Beteiligungsgesellschaft mbH. Screw type compressor. 4,619,596, Cl. 418-201.000.

Dana Corporation: *See*—
Siemon, Edward C., 4,620,296, Cl. 363-51.000.

Daniell, Thomas P.; Harding, Robert C., Jr.; Harvey, Roger W. R.; and Nauckhoff, Sven H. H., to International Business Machines Corporation. Method and apparatus for asynchronous processing of dynamic replication messages. 4,620,276, Cl. 364-200.000.

Daniels, Erwin J.; Kratzer, Bernd; and Schurle, Hermann, to Carl-Zeiss-Stiftung. Ophthalmic lens with a marking and method of producing the marking. 4,619,504, Cl. 351-163.000.

Daniels, John Y.: *See*—
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,619,864, Cl. 428-240.000.

Darby, Jack B. Control means for shifting gears on dual shift bicycles. 4,619,631, Cl. 474-80.000.

Dart Industries Inc.: *See*—
Pool, L. Franklin, 4,619,258, Cl. 128-303.140.

Datakey, Inc.: *See*—
Flies, William P., 4,620,088, Cl. 235-443.000.

Dauphinais, Paul Yvan. Ash-removal shovel. 4,619,474, Cl. 294-9.000.

Davidson, Murray R. Cushioning pad. 4,619,055, Cl. 36-28.000.

Davis, Harry C. Adjustable circular insulation saw system. 4,619,167, Cl. 83-607.000.

Davis, Peter R.; Cooper, Brian F.; and Cottey, David H., to English Electric Valve Company Limited. Method for manufacturing coupled cavity travelling wave tubes. 4,619,041, Cl. 29-600.000.

Davis, Robert I.; and Seador, Thomas G., to FMC Corporation. Process for producing and recovering tributyl phosphate esters. 4,620,024, Cl. 558-113.000.

Davis, Vern E. Throttle-grab bar apparatus for snowmobiles. 4,619,341, Cl. 180-335.000.

Davison, Arthur L.; Blackburn, Martin D.; and Sellek, Donald A., to Baird Corporation. Current meter. 4,620,148, Cl. 324-99.00D.

Davison, Ernest: *See*—
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, 4,619,515, Cl. 355-3.00R.

Day, Robert H.: *See*—
Day, Robert L.; and Day, Robert H., 4,619,540, Cl. 403-24.000.

Day, Robert L.; and Day, Robert H., to S.D.S. Industries, Inc. Spring pivot joint for mannequin. 4,619,540, Cl. 403-24.000.

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Kirchner, Edward C.; and DeFoe, Ronald J., 4,619,414, Cl. 241-261.300.

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Fernandez-Tresguerres Hernandez, Jesus A.; and de Garcini Guedas, Vincente M., 4,619,646, Cl. 604-154.000.

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Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, to Institut Francais du Petrole. Devices for recovering polymetal compounds discharged from a submarine hydrothermal source. 4,619,762, Cl. 210-170.000.

Delagneau, Hubert: *See*—
Weiss, Richard; and Delagneau, Hubert, 4,619,824, Cl. 424-16.000.

Delaney, James M.; and Jozwiak, Edward L., to PPG Industries, Inc. Process for topcoating an electrocoated substrate with a high solids fluid coating. 4,619,746, Cl. 204-181.100.

Delarue, Jean-Jacques; and Ego, Claude, to Societe Nationale Industrielle Aerospatiale. Pyrotechnic valve. 4,619,284, Cl. 137-67.000.

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DeLong, Bradley W., to Phillips Petroleum Company. Gas processing. 4,619,679, Cl. 62-11.000.

Delphax Systems: *See*—
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, 4,619,515, Cl. 355-3.00R.

Delta International Machinery Corp.: *See*—
Miller, David, 4,619,171, Cl. 83-782.000.

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Di Stazio, Giovanni; Politi, Vincenzo; Margonelli, Andrea; De Luca, Giovanna; and Materazzi, Mario, 4,619,916, Cl. 514-18.000.

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Kolts, John H.; and Delzer, Gary A., 4,620,051, Cl. 585-663.000.
Kolts, John H.; and Delzer, Gary A., 4,620,052, Cl. 585-663.000.

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Smith, Allen R.; Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,620,286, Cl. 364-513.000.

Denes, Lucian R., to Shell Oil Company. Method for preparing 4-hydroxycinnolines in a pH controlled system. 4,620,000, Cl. 544-235.000.

Dennis Meggs Enterprises Limited: *See*—
Meggs, Dennis, 4,619,456, Cl. 273-127.00B.

Dennis, Robert A. Apparatus to aid in precision haircutting. 4,619,044, Cl. 30-133.000.

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Hannah, Bruce R.; McClanahan, David D.; and Denny, Lee, 4,619,486, Cl. 312-195.000.

Dent, Michael J.; and Handricks, Ian L., to Contact Lens Supplies Limited. Method of manufacturing a contact lens. 4,619,082, Cl. 51-284.00R.

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Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,619,051, Cl. 34-9.000.

Devantay, Hubert: *See*—
Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, 4,619,753, Cl. 204-290.00F.

Development Finance Corporation of New Zealand: *See*—
Sengchanh, Chanty, 4,620,188, Cl. 340-825.870.

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Beelaard, Wilhelmus A. J.; and de Volder, Johannes A. P., 4,620,174, Cl. 335-212.000.

Dhein, Rolf: *See*—
Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, 4,619,966, Cl. 524-589.000.

Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung. Method of producing porous carbon bodies of high permeability. 4,619,805, Cl. 264-29.500.

Diaz, Adolfo A.: *See*—
Leung, Ignatius Y. P.; and Diaz, Adolfo A., 4,619,074, Cl. 49-143.000.

Dickakian, Ghazi B., to Exxon Chemical Patents Inc. Method to inhibit deposit formation. 4,619,756, Cl. 208-48.0AA.

Dickey, Donna J.; Dobler, Sebastian; and Horejda, Natalie, to United States of America, Health. Physically handicapped shoulder support for attachment to a chair back. 4,619,483, Cl. 297-397.000.

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Yam, David S., 4,620,287, Cl. 364-518.000.

Diehl GmbH & Co.: *See*—
Trummer, Gunther, 4,619,421, Cl. 244-3.160.

Diem, Michael: *See*—
Goldman, Jon C.; Fisk, Michael A.; and Diem, Michael, 4,619,840, Cl. 427-91.000.

Dierichs, Wolfgang: *See*—
Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, 4,619,711, Cl. 134-38.000.

Dieringer, James V.: *See*—
Matheson, Charles L.; Lane, Preston D.; Dieringer, James V.; and Ambafz, Emilio, 4,619,677, Cl. 55-510.000.

Diesch, Robert E.: *See*—
Euteneuer, Charles L.; and Diesch, Robert E., 4,619,452, Cl. 271-305.000.

Diesel Kiki Co., Ltd.: *See*—
Okamoto, Kenji, 4,619,234, Cl. 123-357.000.
Oshizawa, Hidekazu, 4,620,259, Cl. 361-152.000.
Oshizawa, Hidekazu; and Kushida, Takeo, 4,620,260, Cl. 361-152.000.
Yamaguchi, Susumu, 4,619,233, Cl. 123-357.000.

Dietz, Peter W.; and Sharbaugh, Amandus H., to General Electric Company. Non-destructive detection of voids in plastic materials. 4,620,145, Cl. 324-54.000.

Digital Equipment Corporation: *See*—
Goor, Dan; Niles, Everett; and Stone, Robert L., 4,619,872, Cl. 428-632.000.
Dijkstra, Kees; and Huizinga, Jan, to U.S. Philips Corporation. Heat pump comprising a thermally driven liquid pump and liquid pump for use in a heat pump. 4,619,119, Cl. 62-324.200.
Diquet, Joel: *See*—
Boyer, Richard; and Diquet, Joel, 4,619,336, Cl. 177-1.000.
Disselbeck, Dieter; and Vollrath, Hans-Peter, to Hoechst Aktiengesellschaft. Heat exchanger. 4,619,317, Cl. 165-162.000.
Di Stazio, Giovanni; Politi, Vincenzo; Margonelli, Andrea; De Luca, Giovanna; and Materazzi, Mario, to Polifarma S.p.A. Tripeptide compounds containing pyroglutamic acid and tryptophan, process for their production and therapeutic applications. 4,619,916, Cl. 514-18.000.
Dix, Johannes P.: *See*—
Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, 4,619,992, Cl. 534-733.000.
Dixon, Dan M.; and Drexel, Richard J., Jr., to Engelhard Corporation. Nonionic surfactant treated clays, methods of making same, water-based paints, organic solvent-based paints and paper coatings containing same. 4,619,705, Cl. 106-288.00B.
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, to International Business Machines Corporation. Ribbon feed with ink depletion compensation. 4,619,537, Cl. 400-225.000.
Dobler, Sebastian: *See*—
Dickey, Donna J.; Dobler, Sebastian; and Horejda, Natalie, 4,619,483, Cl. 297-397.000.
Dr. Ing. h.c.F. Porsche AG: *See*—
Schaible, Walter; and Mast, Peter, 4,619,466, Cl. 280-669.000.
Dr. Ing. h.c.F. Porsche, Aktiengesellschaft: *See*—
Bott, Helmuth, 4,619,137, Cl. 73-146.500.
Kapfer, Jurgen; and Kirchdorffer, Gerhard, 4,619,227, Cl. 123-146.50A.
Dodge, Dennis W., to Itek Corporation. Drive roller biasing mechanism. 4,619,451, Cl. 271-274.000.
Dodge, James S., to B. F. Goodrich Company, The. Stable blends of vinyl chloride and acrylic latexes. 4,619,960, Cl. 524-245.000.
Doerr, Marvin L., to Celanese Corporation. Depolymerization of condensation polymers involving a pre-molecular weight reduction step. 4,620,032, Cl. 562-483.000.
Doi, Toshiki; Shinonaga, Hideo; and Omae, Tadayuki, to Sumitomo Chemical Company, Limited. Polyolefin composition comprising propylene polymer and ethylene/anhydride/ester copolymer. 4,619,969, Cl. 525-93.000.
Domack, Christopher S.: *See*—
Holmes, Bruce J.; Martin, Glenn L.; Domack, Christopher S.; Obara, Clifford J.; and Hassan, Ahmed A., 4,619,423, Cl. 244-130.000.
Donaldson, Timothy P.; Knight, Raymond P.; and Shepheard, John R., to English Electric Valve Company Limited. Electric circuit interrupting devices. 4,620,135, Cl. 315-326.000.
Doorenbos, Harold E.: *See*—
Jones, Giffin D.; and Doorenbos, Harold E., 4,620,045, Cl. 568-873.000.
Dorman, Isidore, to NB Jackets de Puerto Rico. Automatic card selector for random-access card file system. 4,619,367, Cl. 209-608.000.
Dorr, Bruce P.: *See*—
Sheehan, Joseph C. M.; and Dorr, Bruce P., 4,620,319, Cl. 383-33.000.
Dorr-Oliver: *See*—
Hoadley, Jonathan K.; and Freeman, Mark P., deceased, 4,619,747, Cl. 204-182.300.
Dorzbach, Cornelia: *See*—
Schmidbaur, Hubert; Dorzbach, Cornelia; and Bowmaker, Graham, 4,620,020, Cl. 556-18.000.
Doting, Jan, to D. Drukker & Zn. N.V. Diamond Tool. 4,619,563, Cl. 407-118.000.
Dow Chemical Company, The: *See*—
Emerson, Richard R.; Lee, Do I.; and Easterly, James P., 4,619,967, Cl. 524-801.000.
Henton, David E., 4,619,968, Cl. 525-67.000.
Jones, Elvis E.; Pearce, Terry A.; Laird, Dacon C., III; and Everitt, James H., 4,619,669, Cl. 44-1.00G.
Jones, Giffin D.; and Doorenbos, Harold E., 4,620,045, Cl. 568-873.000.
Lam, Chiu T.; and Shannon, David M., 4,620,043, Cl. 568-801.000.
Lay, George E.; Knipstein, Richard A.; and Haigh, Daniel H., 4,619,826, Cl. 424-78.000.
Schols, John A.; and Yu, Kee C., 4,619,953, Cl. 523-465.000.
Siegel, Sanford A., 4,620,026, Cl. 560-85.000.
Dow Chemical (Nederl) B.V.: *See*—
Franken, Ferdinand M. J., 4,619,143, Cl. 73-598.000.
Dowbenko, Rostyslaw: *See*—
Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., 4,619,952, Cl. 523-409.000.
Dozier, Harold W.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.
Dragan, William B. Bulk dental syringe. 4,619,613, Cl. 433-90.000.
Drake, Charles A.; and Johnson, Marvin M., to Phillips Petroleum Company. Preparation of butyrolactone by catalytic hydrogenation of succinic anhydride. 4,620,016, Cl. 549-325.000.
Drake, Charles A., to Phillips Petroleum Company. Catalytic hydrogenation of succinic anhydride to butyrolactone. 4,620,017, Cl. 549-325.000.
Drake, Herbert G.: *See*—
Rathmann, Thomas M.; Drake, Herbert G.; Mirkovich, Ninko T.; and Lachenbruch, Roger B., 4,619,573, Cl. 414-222.000.
Dresser Industries, Inc.: *See*—
Biek, Paul A., 4,619,435, Cl. 251-25.000.
Osburn, Larry E.; and Wells, Melvin W., 4,619,052, Cl. 34-10.000.
Drexel Equipment (UK) Limited: *See*—
Armell, Richard A.; and Scott, Andrew, 4,619,322, Cl. 166-241.000.
Drexel, Richard J., Jr.: *See*—
Dixon, Dan M.; and Drexel, Richard J., Jr., 4,619,705, Cl. 106-288.00B.
Drogo, Pierre L. M. Electric connector with pull-out plug. 4,619,491, Cl. 339-45.00M.
Drueck, Fred, Jr. Self-erecting hollow structure. 4,619,426, Cl. 248-174.000.
Druetzler, Thomas W., to Sherwin-Williams Company, The. Isocyanate functional urethanes as flexibilizing additives in coating vehicles. 4,619,955, Cl. 524-29 000.
Drummond, George S.: *See*—
Kappas, Attallah; and Drummond, George S., 4,619,923, Cl. 514-185.000.
Dubovi, Edward J.: *See*—
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,619,942, Cl. 514-415.000.
Dubrulle, Gerard; and Roullet, Alain, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Process and installation for cooling a powder by means of a refrigerating fluid. 4,619,113, Cl. 62-64.000.
Ducloux, Marcel L., to Saint-Gobain Cinematique et Controle. Method and apparatus for optical inspection of transparent articles. 4,620,090, Cl. 250-223.00B.
Duffey, Donn W.: *See*—
Schoeneweis, E. Frederick; and Duffey, Donn W., 4,619,283, Cl. 137-15.000.
Duling, Irl N., III: *See*—
Sizer, Theodore, II; Duling, Irl N., III; Petras, Carl H.; and Letzring, Samuel A., 4,620,113, Cl. 307-270.000.
Dumas, Gerard; and Marcoux, Jean A. Apparatus for thawing, handling and reheating sealed frozen food packets. 4,619,191, Cl. 99-483.000.
Duncan, Robert C.: *See*—
Healey, James A.; Duncan, Robert C.; and Roussel, Charles F., 4,619,813, Cl. 422-171.000.
Dunn, William J.: *See*—
Rath, Lucien M.; and Dunn, William J., 4,619,648, Cl. 604-326.000.
Dunstan & Partners Pty. Ltd.: *See*—
Dunstan, Trevor G., 4,619,531, Cl. 366-3.000.
Dunstan, Trevor G., to Dunstan & Partners Pty. Ltd. Batching plant. 4,619,531, Cl. 366-3.000.
Du Pont de Nemours, E. I., and Company: *See*—
Aikens, Paul W., 4,619,164, Cl. 83-200.000.
Cescon, Lawrence A.; and Trebilcock, Robert W., 4,619,721, Cl. 149-21.000.
Heinsohn, George E.; and Rao, Vellayur N. M., 4,620,030, Cl. 560-338.000.
Spencer, Dudley W. C., 4,619,642, Cl. 604-29.000.
Duracell Inc.: *See*—
McArthur, William J.; and Merry, Glenn W., 4,620,111, Cl. 307-150.000.
Durr-Dental GmbH & Co. KG: *See*—
Rosenstatter, Otto, 4,619,009, Cl. 15-29.000.
Durual, Pierre: *See*—
Cognion, Jean-Marie; and Durual, Pierre, 4,620,050, Cl. 585-640.000.
Dyer, Paul N.; and Pierantozzi, Ronald, to Air Products and Chemicals, Inc. Catalyst for selective conversion of synthesis gas and method of making the catalyst. 4,619,910, Cl. 502-336.000.
Dynamit Nobel Aktiengesellschaft: *See*—
Hagel, Rainer; and Redecker, Klaus, 4,620,046, Cl. 568-930.000.
Dyson, James O.: *See*—
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
Dzus Fastener Co. Inc.: *See*—
Wright, Andrew C. W., 4,619,569, Cl. 411-347.000.
E. D. Bullard Company: *See*—
Moretti, Anthony L.; and Pellolio, Anselmo P., Jr., 4,619,254, Cl. 128-201.230.
East/West Industries, Inc.: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,619,255, Cl. 128-202.270.
Easterly, James P.: *See*—
Emerson, Richard R.; Lee, Do I.; and Easterly, James P., 4,619,967, Cl. 524-801.000.
Eastman Kodak Company: *See*—
Borsenberger, Paul M., 4,619,877, Cl. 430-31.000.
Bothner, Carl R., 4,619,708, Cl. 134-6.000.

Hills, Robert G., 4,620,250, Cl. 360-102.000.
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,620,055, Cl. 585-438.000.
Leonard, Eric M.; Fister, Robert V.; and Pledger, James R., 4,619,804, Cl. 264-220.000.
Molaire, Michel F.; and Kaplan, Mark S., 4,619,890, Cl. 430-495.000.
Morris, John C.; and Jackson, Winston J., Jr., 4,619,976, Cl. 525-439.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,002, Cl. 544-318.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,006, Cl. 544-402.000.
Singer, Stephen P., 4,619,884, Cl. 430-223.000.
Watt, Peter B., 4,620,235, Cl. 358-293.000.

Eaton Corporation: *See—*
Bryan, Lannie R.; and Schultz, Gary R., 4,619,303, Cl. 152-416.000.
Calviello, Joseph A., 4,620,207, Cl. 357-22.000.

Ebara, Katsuya: *See—*
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.

Ebetino, Frank F.: *See—*
Burch, Homer A.; and Ebetino, Frank F., 4,619,928, Cl. 514-236.000.

Ebina, Kiyoshi: *See—*
Tani, Zempei; Ebina, Kiyoshi; Ichikawa, Osamu; and Imaizumi, Mamoru, 4,620,094, Cl. 250-231.0SE.

Eblen, Otto; Glockler, Gerhard; Kohler, Franz; and Meinusch, Norbert, to Contraves GmbH. Method of fabricating an ink droplet generator for an ink jet printer and ink droplet generator fabricated thereby. 4,620,195, Cl. 346-1.100.

Echevarria, Angel M.; and Echevarria, Michael A. Cellular waterbed component and method of manufacture. 4,619,007, Cl. 5-451.000.

Echevarria, Michael A.: *See—*
Echevarria, Angel M.; and Echevarria, Michael A., 4,619,007, Cl. 5-451.000.

Eckenhoff, James B.; Peery, John R.; and Landrau, Felix A., to ALZA Corporation. Dosage form for use in a body mounted pump. 4,619,652, Cl. 604-415.000.

Eckert, Theodor, to Ciba-Geigy Corporation. Pharmaceutical preparations for topical application which contain salts of alkanecarboxylic acids, novel carboxylic acid salts and the production thereof. 4,619,926, Cl. 514-210.000.

Ecodyne Corporation: *See—*
Yavorsky, William M., 4,619,374, Cl. 220-414.000.

ED. Scharwachter GmbH & Co. KG: *See—*
Brockhaus, Ernst, 4,619,016, Cl. 16-383.000.

Edelstein, William A., to General Electric Company. Nuclear magnetic resonance imaging antenna subsystem having a plurality of non-orthogonal surface coils. 4,620,155, Cl. 324-322.000.

Egami, Kazuhito; and Hirano, Norimitsu, to Kabushiki Kaisha Shicoh Giken. Brushless d.c. motor. 4,620,139, Cl. 318-254.000.

Ego, Claude: *See—*
Delarue, Jean-Jacques; and Ego, Claude, 4,619,284, Cl. 137-67.000.

Ehrlich, Daniel J.: *See—*
Bozler, Carl O.; Ehrlich, Daniel J.; and Tsao, Jeffrey Y., 4,619,894, Cl. 430-942.000.

Eigen, Edward; and Simone, Alexander J., to Colgate-Palmolive Company. Control of dental plaque and caries. 4,619,825, Cl. 424-49.000.

Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, to Bayer Aktiengesellschaft. Combating fungi with novel azolyl-tetrahydrofuran-2-ylidene-methanes. 4,619,940, Cl. 514-383.000.

Eldridge, Richard I.: *See—*
Baumann, Richard R.; and Eldridge, Richard I., 4,620,266, Cl. 362-32.000.

Electronique Serge Dassault: *See—*
Pailler, Alain L. N., 4,619,197, Cl. 101-93.040.

Elektro-Apparatebau Olten AG.: *See—*
Vogel, Ernst; Berger, Fritz; and Stampfli, Armin, 4,619,497, Cl. 339-244.00R.

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Abdulla, Riaz F.; and Samaritoni, Jack G., 4,619,686, Cl. 71-92.000.
Robison, Robert L., 4,619,935, Cl. 514-281.000.

Elitex, textilniho strojirenstvi: *See—*
Hrus, Miroslav; Svaty, Vladimir; Sidlof, Pavel; and Fisar, Oldrich, 4,619,296, Cl. 139-435.000.

Ellsworth, James G.; and Wulling, Thomas E., to Sperry Corporation. Distributed bus arbitration according each bus user the ability to inhibit all new requests to arbitrate the bus, or to cancel its own pending request, and according the highest priority user the ability to stop the bus. 4,620,278, Cl. 364-200.000.

Elmasry, Mohamed A., to Minnesota Mining and Manufacturing Company. Polymeric dyes with pendent chromophore groups capable of undergoing thermoplastic deformation. 4,619,990, Cl. 534-573.000.

Elmec Corporation: *See—*
Kameya, Kazuo, 4,620,164, Cl. 333-139.000.

Elmer, Willard O.; and Rickel, Edgar J. High clearance self-propelled vehicle with variable clearance and variable wheel spacing. 4,619,340, Cl. 180-209.000.

Elverskog, Bernt, to KB Elverskog Ide & Konstruktion. Life-jacket assembly. 4,619,623, Cl. 441-126.000.

Ely, Stephen R., to Amoco Corporation. Ozone decomposition. 4,619,821, Cl. 423-579.000.

Emblin, Robert T. Method for fabricating a water impervious roof membrane. 4,619,100, Cl. 52-748.000.

Emerson Electric Co.: *See—*
Wang, David C.; and Voepel, Harry W., 4,619,040, Cl. 29-596.000.

Emerson, Richard R.; Lee, Do I.; and Easterly, James P., to Dow Chemical Company, The. Multi-modal emulsions of water-soluble polymers. 4,619,967, Cl. 524-801.000.

Emmer, Ludwig: *See—*
Kneib, Rudi; Emmer, Ludwig; and Robitschko, Peter, 4,619,477, Cl. 296-37.130.

Emori & Co., Ltd: *See—*
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,619,667, Cl. 8-444.000.

Endo, Takeyuki: *See—*
Yasue, Toshikazu; Mese, Michihiro; and Endo, Takeyuki, 4,620,316, Cl. 381-43.000.

Endo, Yoshishige: *See—*
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.

Endter, Horst; and Suther, Herbert, to SMS Hasenclever Maschinenfabrik GmbH. Loading equipment for manipulating tubes in upsetting presses. 4,619,574, Cl. 414-226.000.

Energy Conversion Devices, Inc.: *See—*
Fritzsche, Hellmut; and Johnson, Robert R., 4,620,208, Cl. 357-23.100.
Johncock, Annette G.; and Hudgens, Stephen J., 4,619,729, Cl. 156-606.000.
Keem, John E.; and Flasck, James D., 4,619,865, Cl. 428-333.000.

Engel, Roger: *See—*
Papciak, Walter A.; Hoffman, Karl K.; Engel, Roger; and Wieczorek, Adam, 4,620,247, Cl. 360-97.000.

Engel, Thomas P. Method for producing an improved polymeric heat exchange panel. 4,619,801, Cl. 264-146.000.

Engelbach, Heinz: *See—*
Krabetz, Richard; and Engelbach, Heinz, 4,620,035, Cl. 562-534.000.

Engelhard Corporation: *See—*
Dixon, Dan M.; and Drexel, Richard J., Jr., 4,619,705, Cl. 106-288.00B.

Engelhardt, Edward L.; and Saari, Walfred S., to Merck & Co., Inc. Novel nitropyrazinyl- and nitropyridinyl- substituted piperazin-3-one and hexahydro-1H-1,4-diazepin-5-one compounds useful as adjuncts to radiation therapy. 4,619,927, Cl. 514-218.000.

English Electric Valve Company Limited: *See—*
Davis, Peter R.; Cooper, Brian F.; and Cottey, David H., 4,619,041, Cl. 29-600.000.
Donaldson, Timothy P.; Knight, Raymond P.; and Shepheard, John R., 4,620,135, Cl. 315-326.000.

Enoxy Chemical Limited: *See—*
Jenkins, Derek K., 4,619,982, Cl. 526-164.000.

Erdmannsdorfer, Hans, to Filterwerk Mann & Hummel GmbH. Dual-element filter cartridge for air intake filters designed for a dusty environment. 4,619,674, Cl. 55-486.000.

Erker, Joseph W., to Technicare Corporation. Controlled cutoff frequency analog filter for CT scanners. 4,620,313, Cl. 378-19.000.

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Reinheimer, Guenter; and Gaul, Norbert, 4,619,503, Cl. 350-511.000.

Eskofot A/S: *See—*
Hougaard, Finn, 4,619,526, Cl. 355-73.000.

Essilor International (Compagnie Generale d'Optique): *See—*
Hache, Jean C.; and Servant, Mireille, 4,619,505, Cl. 351-211.000.

Essler, Karl H., to Autoliv GmbH. Apparatus for the automatic rolling up of a vehicle safety belt. 4,619,419, Cl. 242-107.40A.

Ethyl Corporation: *See—*
Sutker, Burton J.; Hussain, Saadat; and Mossaad, Amgad S., 4,619,961, Cl. 524-393.000.

Euteneuer, Charles L.; and Diesch, Robert E., to Pako Corporation. Photographic print sorter. 4,619,452, Cl. 271-305.000.

Evans, Bryn: *See—*
Goldney, Dennis G.; and Evans, Bryn, 4,619,403, Cl. 239-456.000.

Evans, James M.: *See—*
Gorman, C. Rodney; Evans, James M.; and Traynor, Sean G., 4,620,028, Cl. 560-193.000.

Everitt, James H.: *See—*
Jones, Elvis E.; Pearce, Terry A.; Laird, Dacon C., III; and Everitt, James H., 4,619,669, Cl. 44-1.00G.

Ewing, John R.: *See—*
Newell, Alton S.; Newell, A. Scott, Jr.; Popovich, Paul D.; and Ewing, John R., 4,619,029, Cl. 29-402.050.

Exxon Chemical Patents Inc.: *See—*
Dickakian, Ghazi B., 4,619,756, Cl. 208-48.0AA.

Exxon Production Research Co.: *See—*
Gidley, John L., 4,619,323, Cl. 166-285.000.

Exxon Research and Engineering Co.: *See—*
Fiocco, Robert J., 4,619,709, Cl. 134-22.140.
Genack, Azriel Z.; and Perry, Bruce N., 4,619,528, Cl. 356-301.000.
Petkovic-Luton, Ruzica; and Vallone, Joseph, 4,619,699, Cl. 75-252.000.
Ver Strate, Gary W.; Graessley, William W.; and Kresge, Edward N., 4,620,048, Cl. 585-10.000.

EYE-D Development II Ltd.: *See—*
Hill, Robert B., 4,620,318, Cl. 382-2.000.

Facet Enterprises, Incorporated: *See—*
Moore, Harry W., III, 4,619,588, Cl. 417-366.000.

Fag Kugelfischer Georg Schafer KGaA: *See—*
Merkel, Werner, 4,620,101, Cl. 250-376.000.
Fairchild Camera & Instrument Corp.: *See—*
Lehrer, William I., 4,619,839, Cl. 427-82.000.
Pierce, John M.; and Lehrer, William I., 4,619,844, Cl. 427-248.100.
Fairchild Weston Systems, Inc.: *See—*
Thornton, James P., 4,620,261, Cl. 361-154.000.
Waggener, William N., 4,620,160, Cl. 329-104.000.
Fang, Sheng, to Advanced Micro Devices, Inc. Balanced CMOS logic circuits. 4,620,117, Cl. 307-451.000.
Fanuc Ltd: *See—*
Yamazaki, Etuo; and Matsuura, Hitoshi, 4,620,142, Cl. 318-578.000.
Faran, James J., Jr.; Fichtenbaum, Matthew L.; and Kabele, William C., to Gen Rad, Inc. Method of and apparatus for multiplexed automatic testing of electronic circuits and the like. 4,620,304, Cl. 371-20.000.
Faria, Sixdeniel, to GTE Products Corporation. Photoconductors of reduced photosensitivity and process for producing same. 4,619,882, Cl. 430-95.000.
Farque, Claude A., to Oil Dynamics, Inc. Parameter telemetering from the bottom of a deep borehole. 4,620,189, Cl. 340-856.000.
Farrall, George A.; and Van Noy, John H., to General Electric Company. Synchronously operable electrical current switching apparatus having multiple circuit switching capability and/or reduced contact resistance. 4,620,123, Cl. 310-331.000.
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Fast, Patricia E.: *See—*
Stringfellow, Dale A.; and Fast, Patricia E., 4,619,933, Cl. 514-272.000.
Fauss, Rudolf: *See—*
Findeisen, Kurt; and Fauss, Rudolf, 4,620,022, Cl. 556-417.000.
Feinwerktechnik Schleicher & Co., Firma: *See—*
Goldhammer, Albert, 4,619,407, Cl. 241-30.000.
Feist, Betsy: *See—*
Szmuk, Szilvia; Kirouac, J. Paul; and Feist, Betsy, 4,619,399, Cl. 229-72.000.
Felter, Mark R. Water sports apparatus. 4,619,620, Cl. 441-66.000.
Felthuis, Jacob; Van Laar, Jacobus; and Rengersen, Jacob, to Hoogovens Groep B.V. Shaft furnace having a metal shell, a refractory lining and cooling bodies projecting through the shell into the lining. 4,619,441, Cl. 266-193.000.
Ferenc, Robert A., to Whelen Engineering Co., Inc. Low-profile modular lightbar assembly. 4,620,268, Cl. 362-74.000.
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Clarke, John J., 4,619,616, Cl. 434-22.000.
McPherson, Hugh; and Blakely, John P., 4,620,112, Cl. 307-239.000.
Fetterly, Donald R.: *See—*
Schlunt, Richard S.; Schmid, Hans-Peter; and Fetterly, Donald R., 4,620,293, Cl. 364-845.000.
Fialko, Margaret: *See—*
Gosis, Anatoly I.; Fialko, Margaret; and Hanz, George J., 4,620,105, Cl. 250-505.100.
Fiberglas Canada Inc.: *See—*
Harris, Leslie J., 4,619,415, Cl. 242-18.00G.
Fibrestone Incorporated: *See—*
Sudrabin, David A., 4,619,032, Cl. 29-460.000.
Fichtel & Sachs AG: *See—*
Rostin, Gunther; Scheer, Erich; Kolb, Dieter; and Werner, Karl H., 4,619,354, Cl. 192-89.00B.
Fichtenbaum, Matthew L.: *See—*
Faran, James J., Jr.; Fichtenbaum, Matthew L.; and Kabele, William C., 4,620,304, Cl. 371-20.000.
Fikhte, Boris A.: *See—*
Nikitin, Vladimir A.; Khokhlov, Anatoly M.; Larin, Vyacheslav T.; and Fikhte, Boris A., 4,619,899, Cl. 435-287.000.
Filterwerk Mann & Hummel GmbH: *See—*
Erdmannsdorfer, Hans, 4,619,674, Cl. 55-486.000.
Findeisen, Kurt; and Fauss, Rudolf, to Bayer Aktiengesellschaft. Preparation of substituted trialkylsilyloxymalonic acid dinitriles. 4,620,022, Cl. 556-417.000.
Fiocco, Robert J., to Exxon Research and Engineering Co. Chemical treatment for improved pipe line flushing. 4,619,709, Cl. 134-22.140.
Firestone Tire & Rubber Company, The: *See—*
Yang, James H. C., 4,619,094, Cl. 52-410.000.
Fisar, Oldrich: *See—*
Hrus, Miroslav; Svaty, Vladimir; Sidlof, Pavel; and Fisar, Oldrich, 4,619,296, Cl. 139-435.000.
Fischell, Robert E., to Johns Hopkins University, The. Apparatus for detecting at least one predetermined condition and providing an informational signal in response thereto in a medication infusion system. 4,619,653, Cl. 604-891.000.
Fischer, Edward M., to Minnesota Mining and Manufacturing Company. High temperature oil boom cover blanket. 4,619,553, Cl. 405-63.000.
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Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
Fischer, Hermann, to M.A.N.-Roland Druckmaschinen Aktiengesellschaft. Folding apparatus for folding superposed multiple webs. 4,619,449, Cl. 270-5.000.
Fisher Controls International, Inc.: *See—*
Bonzer, William J.; and Scott, Gary L., 4,619,436, Cl. 251-61.100.
Fisher, Harland S.: *See—*
Cook, Stephen F.; Fisher, Harland S.; and Kosciuczyk, Theodore E., 4,619,726, Cl. 156-366.000.
Fisher, Jimmie L.; Kovalan, Mark A.; and Wiscons, Bryon L., to Rockwell International Corporation. Multimaster CPU system with early memory addressing. 4,620,277, Cl. 364-200.000.
Fishgal, Semyon I., to Can-Am Engineering Corporation. Hydraulic system and method of improving the working properties thereof. 4,619,406, Cl. 241-5.000.
Fisk, Michael A.: *See—*
Goldman, Jon C.; Fisk, Michael A.; and Diem, Michael, 4,619,840, Cl. 427-91.000.
Fister, Robert V.: *See—*
Leonard, Eric M.; Fister, Robert V.; and Pledger, James R., 4,619,804, Cl. 264-220.000.
Fitzgerald, Maryanne: *See—*
Christiansen, Jean E.; Fitzgerald, Maryanne; Moeller, Mitchell G.; Pascalides, Artemis; and Vayda, R. Thaddeus, 4,619,660, Cl. 623-46.000.
Fitzpatrick, Denis: *See—*
Bartos, Dezzo S.; and Fitzpatrick, Denis, 4,619,903, Cl. 436-517.000.
Flasck, James D.: *See—*
Keem, John E.; and Flasck, James D., 4,619,865, Cl. 428-333.000.
Flies, William P., to Datakey, Inc. Receptacle design for use with electronic key-like device. 4,620,088, Cl. 235-443.000.
Flusberg, Allen M., to Avco Everett Research Laboratory, Inc. Gas laser and method of operation. 4,620,305, Cl. 372-37.000.
FMC Corporation: *See—*
Davis, Robert I.; and Seador, Thomas G., 4,620,024, Cl. 558-113.000.
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.
Fodor, Gabor B.: *See—*
Szent-Gyorgyi, Albert; and Fodor, Gabor B., 4,620,014, Cl. 548-545.000.
Fontana, Fernando, to Omega SA. Double-safety catch for a bracelet. 4,619,022, Cl. 24-69.00J.
Ford Motor Company: *See—*
Morris, Robert L., 4,619,232, Cl. 123-339.000.
Qaderi, S. Burhan A., 4,619,977, Cl. 525-502.000.
Forell, Mark: *See—*
Kerr, Charles, III; and Forell, Mark, 4,619,624, Cl. 445-22.000.
Formanek, Frank J., to Combustion Engineering, Inc. System and method for consolidating spent nuclear fuel. 4,619,808, Cl. 376-272.000.
Forney, Edgar W., Jr.; and Michael, George W., III, to AMP Incorporated. Coaxial plug and jack connectors. 4,619,496, Cl. 339-177.00R.
Forry, John S.: *See—*
Brown, David S.; Forry, John S.; Mentzer, Nancy E.; and Misselhorn, Donald J., 4,619,860, Cl. 428-213.000.
Frackenpohl, Alfred: *See—*
Vollmer, Jurgen; and Frackenpohl, Alfred, 4,619,543, Cl. 403-114.000.
Frame, Gary E., to Liprad Associates. Compensated light pen with variable attenuator. 4,620,107, Cl. 250-566.000.
France Bed Co., Ltd.: *See—*
Sasaki, Noboru, 4,619,445, Cl. 267-100.000.
Francois, Bernard, to Usinor. Optimizing process and device in a process for reducing the size of the flowering of a galvanized steel strip. 4,619,835, Cl. 427-8.000.
Frank-Voeglein, Doris: *See—*
Weber, Walter; and Frank-Voeglein, Doris, 4,619,612, Cl. 433-80.000.
Franken, Ferdinand M. J., to Dow Chemical (Nederl) B.V. Apparatus and method for the non-destructive inspection of solid bodies. 4,619,143, Cl. 73-598.000.
Franzen, Rune G., to Koppers Company, Inc. Method for screening or fractionation. 4,619,761, Cl. 209-250.000.
Fraser Inc.: *See—*
Healey, James A.; Duncan, Robert C.; and Roussel, Charles F., 4,619,813, Cl. 422-171.000.
Freeman, Helen M., executrix: *See—*
Hoadley, Jonathan K.; and Freeman, Mark P., deceased, 4,619,747, Cl. 204-182.300.
Freeman, Mark P., deceased: *See—*
Hoadley, Jonathan K.; and Freeman, Mark P., deceased, 4,619,747, Cl. 204-182.300.
Fremery, Johan K.; Lindenau, Bernd; and Witthauer, Klaus, to Kernforschungsanlage Julich; and RWD-Datentechnik GmbH. Method of and apparatus for gas pressure measurement by the gas-friction principle. 4,619,144, Cl. 73-708.000.
Frick, John G., Jr.; Jones, Brian W.; Stone, Robbie L.; and Watson, Michael D., to United States of America, Agriculture. Dyed wrinkle-resistant and durable-press cotton fabrics. 4,619,668, Cl. 8-496.000.
Fried Krupp GmbH: *See—*
Jachowski, Johannes; and Pant, Paul, 4,619,692, Cl. 75-10.250.
Frisbie, Jeffrey S.; and Samson, Wilfred J., to Advanced Cardiovascular Systems, Inc. Adjustable rotation limiter device for steerable dilatation catheters. 4,619,263, Cl. 128-344.000.

Frison, Emmett, to Brudi Equipment Co. Free standing lift truck attachment with quick connection. 4,619,579, Cl. 414-607.000.

Fritzsche, Hellmut; and Johnson, Robert R., to Energy Conversion Devices, Inc. High performance, small area thin film transistor. 4,620,208, Cl. 357-23.100.

Fuji Jukogyo Kabushiki Kaisha: *See*—
Kataoka, Ryuji, 4,619,235, Cl. 123-440.000.
Sakai, Yasuhito, 4,619,157, Cl. 74-689.000.

Fuji Photo Film Co., Ltd.: *See*—
Aono, Toshiaki; Nakamura, Koichi; and Nakamura, Taku, 4,619,883, Cl. 430-203.000.
Fukai, Nobutaka, 4,620,200, Cl. 346-108.000.
Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,619,880, Cl. 430-58.000.
Kamada, Koh; Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,619,856, Cl. 428-143.000.
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kouzou; and Hirai, Hiroyuki, 4,619,888, Cl. 430-353.000.
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,619,881, Cl. 430-77.000.
Okita, Tsutomu; Yamaguchi, Nobutaka; and Hashimoto, Hiroshi, 4,619,855, Cl. 428-143.000.
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,619,868, Cl. 428-425.100.
Okutsu, Eiichi, 4,619,886, Cl. 430-265.000.
Takagi, Yoshihiro; and Adachi, Keiichi, 4,619,893, Cl. 430-519.000.
Takahashi, Michihiko; Saito, Eiichi; Okano, Takeshi; and Nakaoka, Sadaaki, 4,619,519, Cl. 355-11.000.
Takahashi, Osamu, 4,619,891, Cl. 430-505.000.
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; and Harada, Shigeo, 4,620,096, Cl. 250-319.000.
Tanaka, Hiroshi; Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,620,097, Cl. 250-327.200.
Tisue, J. Gilbert, 4,620,232, Cl. 358-213.000.
Yamana, Keiichi; Tachibana, Hajime; and Ohtsuka, Shuichi, 4,619,513, Cl. 355-3.0CH.
Yuyama, Hideo; and Tsubota, Motohiko, 4,619,889, Cl. 430-406.000.

Fujii, Fumiaki, to Hitachi, Ltd. Retrieval signal recording apparatus for magnetic tape recording/reproducing apparatus. 4,620,239, Cl. 360-8.000.

Fuji, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, to Kowa Co., Ltd. 1-isopropyl-4[(4-tetrahydro-1-naphthoyloxy phenyl)(alkylene)-carbonyl(oxymethlcarbonyl)]piperazines having chymotrypsin-inhibitory activity. 4,620,005, Cl. 544-391.000.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Ether carbinols, process for preparing same, products produced according to said processes containing said ether carbinols, organoleptic uses thereof, ether carboxaldehydes and organoleptic uses thereof. 4,619,780, Cl. 252-522.00R.

Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., to International Flavors & Fragrances Inc. Ether carbinols. 4,620,041, Cl. 568-665.000.

Fujioka, Takafumi: *See*—
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,619,932, Cl. 514-253.000.

Fujioka, Yoshihisa: *See*—
Amano, Toshio; Fujioka, Yoshihisa; Nagai, Kunio; and Oda, Osamu, 4,620,229, Cl. 358-194.100.

Fujita, Takashi: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.

Fujitsu Limited: *See*—
Aizaki, Yoshihiko, 4,620,087, Cl. 235-379.000.

Fujiwara, Shigemi, to Kabushiki Kaisha Toshiba. Radiation photographing apparatus. 4,620,098, Cl. 250-327.200.

Fuka, Kent A.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Fukai, Nobutaka, to Fuji Photo Film Co., Ltd. Scan beam velocity-compensation recording system. 4,620,200, Cl. 346-108.000.

Fukuda Metal Foil & Powder Co., Ltd.: *See*—
Takami, Masato, 4,619,871, Cl. 428-607.000.

Fulton, Donald E.; and Sassower, Stanley P., to IMEC Corporation. Line-regenerative motor controller with current limiter. 4,620,272, Cl. 363-53.000.

Funakoshi, Yasunobu: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.

Futaba, Takeshi, to Koyo Jidoki Kabushiki Kaisha. Rack and pinion steering device. 4,619,155, Cl. 74-498.000.

Futaba, Takeshi; and Noguchi, Masahiko, to Koyo Jidoki Kabushiki Kaisha. Fluid pressure control device in power steering apparatus. 4,619,339, Cl. 180-143.000.

Futurecraft Corporation: *See*—
Piet, Meyer, 4,619,285, Cl. 137-68.200.

Galer, Herbert W. Plastic paint container. 4,619,373, Cl. 220-354.000.

Gallaher Limited: *See*—
Smeed, Clement G.; and Browning, Shane C., 4,619,278, Cl. 131-284.000.

Gandillon, Jean-Paul. Decorative material for walls of buildings. 4,619,093, Cl. 52-311.000.

Gant, Alan D.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Gartner, Ellis M., to Union Oil Company of California. Rare earth modifiers for Portland cement. 4,619,702, Cl. 106-89.000.

Gartner, Karl, to Yoshida Kogyo K. K. Curtain wall construction having panel support device. 4,619,091, Cl. 52-235.000.

Garwin, Richard L.; and Thompson, David A., to International Business Machines Corporation. Low mass actuator system for magnetic recording disk. 4,620,253, Cl. 360-107.000.

Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy W. W., to Willi Studer AG. Method and apparatus for recording and replay of digital audio data. 4,620,238, Cl. 360-8.000.

Gatayama, Tetsuya: *See*—
Kanno, Ken-ichi; Gatayama, Tetsuya; Koyama, Masao; and Koezuka, Junji, 4,619,739, Cl. 204-1.00T.

Gaudlitz, Robert T.: *See*—
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.

Gaul, Norbert: *See*—
Reinheimer, Guenter; and Gaul, Norbert, 4,619,503, Cl. 350-511.000.

Gauthier-Lafaye, Jean; and Perron, Robert, to Rhone-Poulenc Chimie De Base. Carbonylation of methyl acetate to acetic anhydride. 4,619,791, Cl. 260-549.000.

GEA Luftkuehlergesellschaft Happel GmbH & Co: *See*—
Ruff, Klemens; Suhr, Ludwig; and Paikert, Paul, 4,619,671, Cl. 55-222.000.

Gearhart Industries, Inc.: *See*—
Terrell, Jamie B.; and Pratt, Donna K., 4,619,318, Cl. 166-55.000.

Gebauer, Helmut: *See*—
Kreuzer, Franz-Heinrich; and Gebauer, Helmut, 4,620,023, Cl. 556-460.000.

Gebrueder Heller, Maschinenfabrik GmbH: *See*—
Schmid, Karlheinz; and Bonfert, Heinrich, 4,619,565, Cl. 409-135.000.

Geisinger, Wolfgang, to Muller Manufacturing Ltd. Wrapper sealing system. 4,619,102, Cl. 53-399.000.

Geissler, Ulrich: *See*—
Wingen, Rainer; Geissler, Ulrich; and Ruckert, Hans, 4,619,885, Cl. 430-260.000.

Gen Rad, Inc.: *See*—
Faran, James J., Jr.; Fichtenbaum, Matthew L.; and Kabele, William C., 4,620,304, Cl. 371-20.000.

Genack, Azriel Z.; and Perry, Bruce N., to Exxon Research and Engineering Co. Phase resolved modulation Raman spectrometer. 4,619,528, Cl. 356-301.000.

General Dynamics, Pomona Division: *See*—
Schlunt, Richard S.; Schmid, Hans-Peter; and Fetterly, Donald R., 4,620,293, Cl. 364-845.000.

General Electric Company: *See*—
Ades, Adrian R.; Pribis, Paul B.; and Proach, Donald J., 4,620,086, Cl. 219-552.000.
Baliga, Bantval J.; Temple, Victor A. K.; and Chow, Tat-Sing P., 4,620,211, Cl. 357-38.000.
Bloomer, Milton D., 4,620,258, Cl. 361-91.000.
Brooks, Robert B., 4,619,380, Cl. 222-240.000.
Cooney, Robert W., 4,620,110, Cl. 307-48.000.
Cunningham, Charles R.; and Godden, Glenn S., 4,620,084, Cl. 219-497.000.
Dietz, Peter W.; and Sharbaugh, Amandus H., 4,620,145, Cl. 324-54.000.
Edelstein, William A., 4,620,155, Cl. 324-322.000.
Farrall, George A.; and Van Noy, John H., 4,620,123, Cl. 310-331.000.
Farrall, George A.; and Van Noy, John H., 4,620,124, Cl. 310-332.000.
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Giaever, Ivar; and Keese, Charles R., 4,619,904, Cl. 436-518.000.
Howell, Edward K., 4,620,122, Cl. 310-328.000.
Luthra, Krishan L., 4,620,128, Cl. 313-630.000.
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Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Tunnell, George W.; and Zucker, Martin S., 4,620,099, Cl. 250-358.100.
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Yates, John B., III; and Ullman, Timothy J., 4,619,971, Cl. 525-166.000.

General Electric Co. p.l.c., The: *See—*
Nourshargh, Noorallah; and McCormack, John S., 4,619,680, Cl. 65-3.120.

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Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,782, Cl. 560-122.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,834, Cl. 426-548.000.

General Foods Inc.: *See—*
Anderson, Del M., 4,619,833, Cl. 426-548.000.

General Motors Corporation: *See—*
Jalbing, John I.; and Carriere, Richard T., 4,619,912, Cl. 502-439.000.
Janthur, Ingo W.; Roth, Alfred; and Odry, Stefan, 4,619,073, Cl. 49-74.000.
Stahura, Daniel W.; and Smith, Verl V., Jr., 4,619,875, Cl. 429-143.000.

General Signal Corporation: *See—*
Lipanski, Scott J., 4,619,081, Cl. 51-267.000.

Georg Fischer Aktiengesellschaft: *See—*
Overath, Friedhelm; and Saner, Remo, 4,619,470, Cl. 285-55.000.

George, Flint R., to Halliburton Company. Detonation of tandem guns. 4,619,333, Cl. 175-4.520.

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Geratz, Joachim D.: *See—*
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,619,942, Cl. 514-415.000.

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Gerber, Klaus, to Siemens Aktiengesellschaft. Sleeve for large capacity light waveguide cables. 4,619,499, Cl. 350-96.200.

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Germunson, Gary, to Yakima Wire Works, Inc. Net bag forming method and machine. 4,619,104, Cl. 53-459.000.

Gerritsen, Jan: *See—*
Peels, Antonius H. P. M.; van den Beld, Antonius J. M.; Bijma, Jan; and Gerritsen, Jan, 4,620,134, Cl. 315-15.000.

Giaever, Ivar; and Keese, Charles R., to General Electric Company; and National Foundation for Cancer Research, Inc. Agglutinating immunoassay using protein-coated liquid droplets. 4,619,904, Cl. 436-518.000.

Gibson, Patrick Howard: *See—*
Kennedy, Conrad P., Jr.; and Kennedy, Harry L., 4,619,359, Cl. 198-463.500.

Gidley, John L., to Exxon Production Research Co. Method for conducting workover operations. 4,619,323, Cl. 166-285.000.

Giladett, Leo V., to United States of America, Air Force. Safing and arming mechanism. 4,619,199, Cl. 102-254.000.

Gilbreth, William E., to Builders Equipment and Tool Manufacturing Company. Scaffolding connection apparatus and method. 4,619,549, Cl. 403-349.000.

Gillman, Gary L.: *See—*
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., 4,619,395, Cl. 228-4.500.

Giordano, Claudio: *See—*
Uggeri, Fulvio; Castaldi, Graziano; and Giordano, Claudio, 4,620,031, Cl. 562-466.000.

Girgenti, Russell S., to Auburn International, Inc. Apparatus for monitoring solids feed, dry solids flow. 4,619,145, Cl. 73-861.040.

Gisler, Gary L., to United States of America, National Aeronautics and Space Administration. Emitted vibration measurement device and method. 4,619,142, Cl. 73-462.000.

Gissinger, Bernard C.: *See—*
Thevenin, Patrick D.; Gissinger, Bernard C.; and Thevenin, Stephane J., 4,619,440, Cl. 256-47.000.

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Henniger, Peter W.; and van der Drift, Johannes K., 4,619,786, Cl. 540-310.000.

Gitzendanner, Louis G., to Magnetic Peripherals Inc. Apparatus for controlling humidity in a disk drive. 4,620,248, Cl. 360-97.000.

Gitzendanner, Louis G., to Magnetic Peripherals Inc. Magnetic transducer support structure. 4,620,251, Cl. 360-103.000.

GKN Kwikform Limited: *See—*
Lovering, Dennis W., 4,619,541, Cl. 403-49.000.

Glaenzer Spicer: *See—*
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Glendinning, Sharon G.: *See—*
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Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Schick, Timothy; and Untermyer, Samuel, II, 4,620,100, Cl. 250-358.100.

Glockler, Gerhard: *See—*
Eblen, Otto; Glockler, Gerhard; Kohler, Franz; and Meinusch, Norbert, 4,620,195, Cl. 346-1.100.

Gmur, Peter, to Amrotex AG. Thin walled shaped body and method of producing same. 4,619,857, Cl. 428-186.000.

Gneuss, Detlef. Sieve device for cleaning plastic melts. 4,619,600, Cl. 425-197.000.

Gobbo, Franco: *See—*
Sartor, Leo; and Gobbo, Franco, 4,619,057, Cl. 36-50.000.

Godden, Glenn S.: *See—*
Cunningham, Charles R.; and Godden, Glenn S., 4,620,084, Cl. 219-497.000.

Godo Steel, Ltd.: *See—*
Takai, Kiyoshi; and Iwasaki, Kiyoshi, 4,619,693, Cl. 266-88.000.

Godwin, William R.; and Quattrocchi, Salvatore, to ITT Corporation. Method and apparatus to determine whether a subscriber line is loaded or non-loaded. 4,620,069, Cl. 179-175.30R.

Gold Bond Ice Cream, Inc.: *See—*
Lutsey, Thomas H.; and Bero, Vernon L., 4,619,832, Cl. 426-302.000.

Gold, Elijah H.; and Chang, Wei K., to Schering Corporation. Treatment of hypertension. 4,619,919, Cl. 514-166.000.

Goldhammer, Albert, to Feinwerktechnik Schleicher & Co., Firma. Shredding machine and method of operation. 4,619,407, Cl. 241-30.000.

Goldman, Jon C.; Fisk, Michael A.; and Diem, Michael, to Thermco Systems, Inc. Process and apparatus for low pressure chemical vapor deposition of refractory metal. 4,619,840, Cl. 427-91.000.

Goldney, Dennis G.; and Evans, Bryn, to Hozelock-ASL Limited. Spray guns for spraying liquids. 4,619,403, Cl. 239-456.000.

Golec, Frederick A., Jr.: *See—*
Ueng, Shou-Nan; and Golec, Frederick A., Jr., 4,620,010, Cl. 548-217.000.

Golenbieski, John M.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Goodwin, John D.; and Mulkey, Forrest W., to Molly Maguire, Inc. Sorbant and process using rice hull ash compositions. 4,619,911, Cl. 502-411.000.

Goor, Dan; Niles, Everett; and Stone, Robert L., to Digital Equipment Corporation. Magnetic plated media. 4,619,872, Cl. 428-632.000.

Goosey, John D.: *See—*
Linner, John G.; and Goosey, John D., 4,619,257, Cl. 128-303.100.

Goransson, Rolf E.; and Kalvenes, Oystein, to Internationella Siporex AB. Method and apparatus for lifting pieces of material. 4,619,173, Cl. 8.3-870.000.

Gorbett, Cleon. Soil aerator. 4,619,329, Cl. 172-21.000.

Gordon, Eugene I.; and Levy, Uri, to AT&T Bell Laboratories. Electron beam scannable LED display device. 4,620,132, Cl. 315-3.000.

Gordon, Lance K., to Connaught Laboratories, Inc. Polysaccharide exotoxoid conjugate vaccines. 4,619,828, Cl. 424-92.000.

Gorgerino, Mario D., to O.E.T. - Metalconsult S.r.l. Additive for metallurgical liquids, and method and device for the preparation thereof. 4,619,696, Cl. 75-130.00R.

Gorke, Klaus; and Schoppen, Josef, to Chemische Werke Huls Aktiengesellschaft. Sealing compositions for electric cables. 4,619,951, Cl. 523-173.000.

Gorman, C. Rodney; Evans, James M.; and Traynor, Sean G., to SCM Corporation. Esters of hydroxyalkyl ethers of bornane. 4,620,028, Cl. 560-193.000.

Gosis, Anatoly I.; Fialko, Margaret; and Hanz, George J. Device for attaching a collimator to a radiation detector. 4,620,105, Cl. 250-505.100.

Gostin, Gary B.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Gotal, John D.: *See—*
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.

Goto, Tetsuro; and Nakano, Yoshiyuki, to Nippon Kogaku K. K. Warning system for remaining amount of film in a camera. 4,619,511, Cl. 354-217.000.

Goto, Toshio: *See—*
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,619,688, Cl. 71-92.000.

Gotschi, Erwin; and Hubschwerlen, Christian, to Hoffmann-La Roche Inc. Beta lactams. 4,619,787, Cl. 540-200.000.

Goulter, Victor H. Pineapple eye extractor. 4,619,046, Cl. 30-229.000.

Graessley, William W.: *See—*
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Grand, Paul S.: *See—*
Ramachandran, Pallassana N.; and Grand, Paul S., 4,619,774, Cl. 252-8.700.

Grant, David M. Fail safe automatic flue damper mechanism. 4,619,602, Cl. 431-20.000.

Graphite Sales, Inc.: *See—*
Carlson, Walter H., 4,619,950, Cl. 523-140.000.

Grau, Werner: *See—*
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.

Graville, Brian A.; and Shmakov, Edward, to Welding Institute of - Canada. Pulsed arc welding apparatus. 4,620,082, Cl. 219-130.510.

Graybill, Jeffery J.: *See—*
Graybill, Walter R.; and Graybill, Jeffery J., 4,619,259, Cl. 128-305.000.

Graybill, Walter R.; and Graybill, Jeffery J. Ophthalmic surgery tool. 4,619,259, Cl. 128-305.000.

Green, Richard A.: *See—*
Harman, Douglas G.; Green, Richard A.; and Bevilacqua, Bruce W., 4,619,128, Cl. 72-53.000.

Gregor Hofbauer GmbH: *See—*
Wolfseder, Alfred, 4,619,363, Cl. 206-373.000.

Greutert, Albert. Method for forming composite part comprising a plastic frame and a perforated metal foil. 4,619,048, Cl. 30-346.510.

Gries, Josef: *See—*
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.

Griffin, William J. Centering device and method. 4,619,049, Cl. 33-185.00R.

Gritters, Gregory A.; and Perez, Jose M., to Union Oil Co. of California; Mono Power Co.; and Southern Pacific Land Co. Process for regenerating media filters used to filter geothermal brine. 4,619,769, Cl. 210-747.000.

Grogler, Gerhard: *See—*
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Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., to Bayer Aktiengesellschaft. 6-fluoro-7-chloro-1-cyclopropyl-4-oxo-1,4-dihydro-quinoline-3-carboxylic acid. 4,620,007, Cl. 546-156.000.

Gronning, Erik: *See—*
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Grooms, Ronald L. Mechanical chimney sweep. 4,619,011, Cl. 15-163.000.

Grover, Jerry D. Card for microfilm and method of forming same. 4,619,469, Cl. 283-76.000.

Grudzinskas, Charles A. Inflatable seat cushion assembly. 4,619,481, Cl. 297-284.000.

Gruger, Jeffrey H.: *See—*
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Gruner, Hans; Orsech, Helmuth; and Schrewe, Hans, to Mannesmann Aktiengesellschaft. Quality control in multiple continuous casting plants. 4,619,306, Cl. 164-150.000.

GTE Laboratories Incorporated: *See—*
Natansohn, Samuel; and Czupryna, Gary, 4,619,905, Cl. 501-97.000.

GTE Products Corporation: *See—*
Faria, Sixdeniel, 4,619,882, Cl. 430-95.000.
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,620,125, Cl. 313-25.000.
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,620,130, Cl. 313-634.000.
Shank, Jeffrey B.; and Troutman, Timmy D., 4,619,387, Cl. 225-96.500.

Guerriero, Frederico. Hydrostatic pressure device for bleeding control through an inflatable, stitchable and retrievable balloon-net system. 4,619,261, Cl. 128-325.000.

Gumbert, Jerry F. Footwear corresponding to physiology. 4,619,058, Cl. 36-102.000.

Gungle, W. Calvin: *See—*
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,620,130, Cl. 313-634.000.

Gunn, Charles L., to Procter & Gamble Company, The. Method of forming highly oriented thermoplastic articles. 4,619,806, Cl. 264-522.000.

Gunther, Rolf: *See—*
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Gunthner, Franz, to Schott Glaswerke. Method for operator-controlled molten glass lump processing. 4,619,682, Cl. 65-64.000.

Gustafsson, Christer, to Secoroc AB. Joint device in extension drill equipment for percussive drilling. 4,619,334, Cl. 175-321.000.

Haacon Hebetechnik GmbH: *See—*
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Haag, Walter: *See—*
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Habbe, Randall G., to Olin Corporation. Armor piercing small caliber projectile. 4,619,203, Cl. 102-516.000.

Haber, Terry M.; and Smedley, William H., to Habley Medical Technology Corporation. Mechanical prosthetic sphincter. 4,619,245, Cl. 128-1.00R.

Habley Medical Technology Corporation: *See—*
Haber, Terry M.; and Smedley, William H., 4,619,245, Cl. 128-1.00R.

Hache, Jean C.; and Servant, Mireille, to Essilor International (Compagnie Generale d'Optique). Refractometry process and device for measuring the degree of ametropia, and especially the degree of astigmatism, of the eye. 4,619,505, Cl. 351-211.000.

Hadi, Ferenc: *See—*
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela, 4,619,936, Cl. 514-282.000.

Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, to Sumitomo Chemical Company, Limited. Triazolopyridazines and their use as herbicides. 4,619,687, Cl. 71-92.000.

Hagel, Rainer; and Redecker, Klaus, to Dynamit Nobel Aktiengesellschaft. Nitrated aryl ethers. 4,620,046, Cl. 568-930.000.

Hageman, Martin P.: *See—*
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Hagen, Eric C.: *See—*
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,619,265, Cl. 128-419.00D.

Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, to Hitachi, Ltd.; and Hitachi Denshi Kabusihiki Kaisha. Arithmetic logic unit for floating point data and/or fixed point data. 4,620,292, Cl. 364-748.000.

Haigh, Daniel H.: *See—*
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Hain, Josef; and Russeler, Karl-Friedrich, to Robert Bosch GmbH. Fuel injection pump for internal combustion engines. 4,619,238, Cl. 123-502.000.

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Hakansson, Kurt: *See—*
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Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, to Vegla. Glass sheet blowing assembly. 4,619,683, Cl. 65-351.000.

Halliburton Company: *See—*
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Ringgenberg, Paul D., 4,619,319, Cl. 166-55.100.
Zunkel, Gary D., 4,619,325, Cl. 166-374.000.

Halstead, William M. Method for alignment and insertion of an electric module. 4,619,042, Cl. 29-837.000.

Halwass, Kerstin: *See—*
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Ha.a, Tomio; and Yamazaki, Kiyoyasu, to Nihon Pisuko Kabushiki Kaisha. Valves proper for valve-type fluid-flow controllers. 4,619,287, Cl. 137-513.300.

Hamanaka, Ernest S., to Pfizer Inc. Process and intermediates for the preparation of penem derivatives. 4,619,783, Cl. 540-361.000.

Hamanaka, Ernest S., to Pfizer Inc. 2-alkylthiopenem derivatives. 4,619,924, Cl. 514-195.000.

Hamisch, Paul H., Jr., to Monarch Marking Systems, Inc. Hand-held labeler. 4,619,727, Cl. 156-541.000.

Hammou, Abdelkader; Rigaud, Philippe; and Rousseau, Catherine, to Societe Nationale Elf Aquitaine. Novel process for the synthesis of vanadium oxide, V_6O_{13}. 4,619,822, Cl. 423-592.000.

Handricks, Ian L.: *See—*
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Hanker, Jacob S.; Terry, Bill C.; Ambrose, Wallace W.; and Lupton, Cecel R., to University of North Carolina. Plaster of Paris as a bioresorbable scaffold in implants for bone repair. 4,619,655, Cl. 623-1.000.

Hannah, Bruce R.; McClanahan, David D.; and Denny, Lee, to Knoll International, Inc. Spine assembly. 4,619,486, Cl. 312-195.000.

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Hansel, Gernot: *See—*
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Hansen, Guenter: *See—*
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Hanz, George J.: *See—*
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Hara, Kazuyuki: *See*—
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Hara, Masato, to Asahi Kogaku Kogyo Kabushiki Kaisha. Elevation angle measuring device with apparatus for disabling the device when its inclination angle is offset from a predetermined inclination angle. 4,620,092, Cl. 250-231.0SE.

Hara, Yoshiaki: *See*—
Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, 4,620,102, Cl. 250-427.000.

Harada, Shigeo: *See*—
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Harada, Sumio: *See*—
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Harbeke, Gerold. Barrier-embedded pipe-coupling apparatus and method. 4,619,087, Cl. 52-221.000.

Harbeke, Gerold J. Embedded pipe coupling holder. 4,619,471, Cl. 285-158.000.

Harcourt House: *See*—
Bartos, Dezzo S.; and Fitzpatrick, Denis, 4,619,903, Cl. 436-517.000.

Harding, Robert C., Jr.: *See*—
Daniell, Thomas P.; Harding, Robert C., Jr.; Harvey, Roger W. R.; and Nauckhoff, Sven H. H., 4,620,276, Cl. 364-200.000.

Hardman, Dale G., to Spravrite Manufacturing Co., Inc. Controlled droplet applicator. 4,619,401, Cl. 239-214.170.

Hardy, Clifford D. Fish scaling device. 4,619,019, Cl. 17-67.000.

Hardy, Frederick E., to Procter & Gamble Company, The. Detergent additive product. 4,619,779, Cl. 252-91.000.

Harman, Douglas G.; Green, Richard A.; and Bevilacqua, Bruce W., to Westinghouse Electric Corp. Spindle for rotopeening apparatus. 4,619,128, Cl. 72-53.000.

Harper, Allan C.; Wilson, Joseph H.; McKee, Randall G.; and Lasiter, David N., to Medical Safetec, Inc. Hospital waste disposal system. 4,619,409, Cl. 241-38.000.

Harper, Jeffrey D.: *See*—
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Harrington, Kenneth D.: *See*—
Rhodes, Wayne A.; and Harrington, Kenneth D., 4,619,313, Cl. 165-67.000.

Harris Corporation: *See*—
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Young, Lock R., 4,620,163, Cl. 333-21.00R.

Harris, Leslie J., to Fiberglas Canada Inc. Strand winding apparatus. 4,619,415, Cl. 242-18.00G.

Harris, Michael C.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., to PPG Industries, Inc. Resinous blends of epoxy and acrylic resins and the use thereof in electrodeposition. 4,619,952, Cl. 523-409.000.

Haruna, Tohru; and Nishimura, Atsushi, to Adeka Argus Chemical Co., Ltd. Mixed 2,2,6,6-tetramethyl piperidinyl carboxylic acid ester and amide light stabilizers and stabilized synthetic polymers. 4,619,958, Cl. 524-102.000.

Harvey, Roger W. R.: *See*—
Daniell, Thomas P.; Harding, Robert C., Jr.; Harvey, Roger W. R.; and Nauckhoff, Sven H. H., 4,620,276, Cl. 364-200.000.

Harwood, Jon W., to APX Group, Inc. Air gap pipe. 4,619,292, Cl. 138-113.000.

Harwood, Michael E.: *See*—
Carroll, Michael W.; and Harwood, Michael E., 4,619,085, Cl. 52-192.000.

Hasegawa, Tsuneo, to Man Design Co., Ltd. Therapeutic appliance for improving functions of hand fingers. 4,619,250, Cl. 128-26.000.

Hashimoto, Hiroshi: *See*—
Kamada, Koh; Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,619,856, Cl. 428-143.000.
Okita, Tsutomu; Yamaguchi, Nobutaka; and Hashimoto, Hiroshi, 4,619,855, Cl. 428-143.000.
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,619,868, Cl. 428-425.100.

Hashimoto, Mitsuru, to Ricoh Co., Ltd. Tetrazonium salt compound, disazo compound, method for preparing the same, and photosensitive material containing said disazo compound for use in electrophotography. 4,619,878, Cl. 430-56.000.

Hashimoto, Tadanori; Yoshitake, Hiroshi; Hata, Shigenao; and Nakazono, Akiko, to Sumitomo Chemical Company, Limited. Composition for forming a transparent conductive film. 4,619,704, Cl. 106-286.400.

Hashimoto, Takemi: *See*—
Ogawa, Mutsuo; Hashimoto, Takemi; Hara, Kazuyuki; and Kondo, Mitsuru, 4,620,233, Cl. 358-260.000.

Hashizume, Shinobu: *See*—
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,619,667, Cl. 8-444.000.

Haskell, Richard E.; and Hung, Yau Y., to Industrial Holographics, Inc. Interferometric deformation analysis system. 4,620,223, Cl. 358-107.000.

Hassan, Ahmed A.: *See*—
Holmes, Bruce J.; Martin, Glenn L.; Domack, Christopher S.; Obara, Clifford J.; and Hassan, Ahmed A., 4,619,423, Cl. 244-130.000.

Hata, Hideo: *See*—
Yoshimura, Isao; and Hata, Hideo, 4,619,859, Cl. 428-213.000.

Hata, Shigenao: *See*—
Hashimoto, Tadanori; Yoshitake, Hiroshi; Hata, Shigenao; and Nakazono, Akiko, 4,619,704, Cl. 106-286.400.

Hatada, Koichi: *See*—
Okamoto, Yoshio; and Hatada, Koichi, 4,619,970, Cl. 525-100.000.

Hatanaka, Kaoru; and Miyamaru, Yukio, to Honda Giken Kogyo Kabushiki Kaisha. Winker device. 4,620,177, Cl. 340-81.00R.

Hato, Masakatsu; Shimura, Yukio; and Tsuda, Keishiro, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Enzyme immobilization in a fluorine resin membrane. 4,619,897, Cl. 435-182.000.

Hattori, Eizou: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.

Hattori, Michinori; and Niiya, Kazunori, to Nippon Kokan Kabushiki Kaisha. Cooling box for steel making furnaces. 4,619,442, Cl. 266-193.000.

Hattori, Motoichi; and Ishigo, Hideyasu, to Tokyo Shibaura Denki Kabushiki Kaisha. Automatic telephone answering and recording apparatus. 4,620,065, Cl. 179-6.070.

Hattori, Torao, to Honda Giken Kogyo Kabushiki Kaisha. Belt type continuous reduction gear mechanism. 4,619,630, Cl. 474-72.000.

Haugwitz, Werner, to SKF Gmbh, Schweinfurt. Bearing housing. 4,619,535, Cl. 384-472.000.

Hauni-Werke Korber & Co. KG.: *See*—
Uhlig, Uwe, 4,619,078, Cl. 51-5.00D.

Hauser, Helmut, to Ciba-Geigy Corporation. Spontaneous preparation of small unilamellar liposomes. 4,619,794, Cl. 264-4.100.

Havemann, Robert H.; and Baber, Samuel C., to Texas Instruments Incorporated. Self-aligned low-temperature emitter drive-in. 4,619,036, Cl. 29-577.00C.

Havey, Edward J., Jr.; Miller, Carl; and Westerman, Ted, to Pitney Bowes Inc. Sheet folding inserting machine. 4,619,101, Cl. 53-117.000.

Hawker, Fred D.: *See*—
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,619,051, Cl. 34-9.000.

Hawkings, Robert M., to Raychem Corporation. Guidance and retention device and connector assembly. 4,619,490, Cl. 339-31.00M.

Haws, Lewis A.: *See*—
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.

Hayase, Isao: *See*—
Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, 4,619,595, Cl. 418-83.000.

Hayashi, Eiji, to Yokogawa Hokushin Electric Corporation. Reactive power to DC signal converter. 4,620,157, Cl. 328-160.000.

Hayashi, Kenro: *See*—
Tanaka, Takashi; and Hayashi, Kenro, 4,619,798, Cl. 264-62.000.

Hayes, Charles L. Control stick mechanism. 4,620,176, Cl. 338-128.000.

Hayes, Ernest R., to Nova Chem Limited. N,O-carboxymethyl chitosan and preparative method therefor. 4,619,995, Cl. 536-20.000.

Hayes, Thomas G.: *See*—
Skarstad, Paul M.; and Hayes, Thomas G., 4,619,874, Cl. 429-91.000.

Hayman, Cecil: *See*—
Chalk, Christine D.; and Hayman, Cecil, 4,619,778, Cl. 252-70.000.

HB Autonom: *See*—
Sundberg, Bo; and Jonason, Hans, 4,619,222, Cl. 119-15.50R.

Healey, James A.; Duncan, Robert C.; and Roussel, Charles F., to Fraser Inc. Gas absorption system. 4,619,813, Cl. 422-171.000.

Heath Company: *See*—
Perdue, Terry A., 4,620,285, Cl. 364-513.000.

Heckman, Sandy D., to John Morrell & Company. Meat trimming knife with wrist strain relief device. 4,619,047, Cl. 30-276.000.

Hedrick, Dennis R.: *See*—
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, 4,619,537, Cl. 400-225.000.

Heeks, John S., to International Standard Electric Corporation. Optical phase array radar. 4,620,193, Cl. 342-200.000.

Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., to Janssen Pharmaceutica, N.V. [[4-[4-(4-phenyl-1-piperazinyl)phenoxymethyl]-1,3-dioxolan-2-yl]methyl]-1H-imidazoles and 1H-1,2,4-triazoles. 4,619,931, Cl. 514-252.000.

Heilmann, Steven M.: *See*—
Charbonneau, Robert R.; Heilmann, Steven M.; Rasmussen, Jerald K.; and Tumey, Michael L., 4,619,867, Cl. 428-355.000.

Heilweil, Israel J.; and Hoskin, Dennis H., to Mobil Oil Corporation. High temperature stable aqueous brine fluids viscosified by water-soluble copolymers of acrylamidomethylpropanesulfonic acid salts. 4,619,773, Cl. 252-8.514.

Heimnick, Paul; and Johnson, LeRoy B., to Schmelzer Corporation. Powered adjustable arm rest. 4,619,478, Cl. 296-153.000.

Heinrich Oelschlager Metallwarenfabrik: *See*—
Leymann, Friedhelm, 4,619,427, Cl. 248-178.000.

Heinsohn, George E.; and Rao, Velliyur N. M., to Du Pont de Nemours, E. I., and Company. Preparation of methyl isocyanate in a quartz reactor. 4,620,030, Cl. 560-338.000.

Heinzl, Joachim; Penningsfeld, Hans-Dieter; and Berdelle-Hilge, Peter, to Siemens Aktiengesellschaft. Magnetic driver ink jet. 4,620,201, Cl. 346-140.00R.

Held, Herr K. Dual-belt press for a continuously advancing web of material. 4,619,195, Cl. 100-154.000.

Helfer, Joel N.: *See*—
Burger, Laurie J.; Helfer, Joel N.; Protzmann, Donald E.; and Uhl, Robert F., 4,619,271, Cl. 128-736.000.

Hellring, Stuart D.: *See*—
Chang, Clarence D.; and Hellring, Stuart D., 4,620,044, Cl. 568-833.000.

Hellstrom, Gunnar, to Saab-Scania Aktiebolag. Arrangement for deflecting powder gases from an aircraft weapon. 4,619,182, Cl. 89-37.160.

Helms, Richard A.; Timm, Gerald W.; and Sandford, Donald L., to Dacomed Corporation. Penile prosthesis having an actuator means interacting with a member and articulated column. 4,619,251, Cl. 128-79.000.

Hemmeter, Richard W.: *See*—
Bushnell, William J.; Hemmeter, Richard W.; and Raghavan, Palanichamy, 4,620,066, Cl. 179-27.00D.

Hen-Jac, Inc.: *See*—
Kenny, Patrick M., 4,619,218, Cl. 114-295.000.

Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., to Springs Industries, Inc. Fabric with reduced permeability to down and fiber fill and method of producing same. 4,619,864, Cl. 428-240.000.

Hengstler GmbH Geschaftsbereich Haller-Relais: *See*—
Rudolf, Reiner, 4,620,172, Cl. 335-78.000.

Henkel Kommanditgesellschaft auf Aktien: *See*—
Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, 4,619,711, Cl. 134-38.000.
Rose, David; Lieske, Edgar; and Maak, Norbert, 4,619,666, Cl. 8-414.000.

Henniger, Peter W.; and van der Drift, Johannes K., to Gist-Brocades N.V. Preparation of 6-α-bromo- and/or 6,6-dibromo-penicillanic acid-1,1-dioxides. 4,619,786, Cl. 540-310.000.

Henning, Rainer; Urbach, Hansjorg; Teetz, Volker; and Becker, Reinhard, to Hoechst Aktiengesellschaft. Spirocyclic aminoacid derivatives, processes for their preparation, agents containing them and their use and new spirocyclic aminoacids as intermediates and processes for their preparation. 4,620,012, Cl. 548-411.000.

Henricson, Kaj O.; and Peltola, Pekka O., to A. Ahlstrom Osakeyhtio. Apparatus for defiberizing, screening and pumping cellulose pulp or recycled paper. 4,619,736, Cl. 162-261.000.

Henton, David E., to Dow Chemical Company, The. Flame resistant carbonate blends. 4,619,968, Cl. 525-67.000.

Herb, Eugen: *See*—
Leibinger, Berthold; and Herb, Eugen, 4,619,448, Cl. 269-303.000.

Herbert, Adolf; Bellmer, Klaus; and Trocha, Jobst, to Hermann Berstorff Maschinenbau GmbH. Extrusion head. 4,619,599, Cl. 425-186.000.

Herchenbach, Horst; and Ramesohl, Hubert, to Klockner-Humboldt-Deutz AG. Method for the thermal treatment of calcareous mineral raw materials. 4,619,605, Cl. 432-14.000.

Herman Miller, Inc.: *See*—
Kurrasch, Andrew J., 4,619,208, Cl. 108-144.000.

Herman, Paul F.: *See*—
Kennedy, T. Scott; and Herman, Paul F., 4,619,948, Cl. 521-52.000.

Hermann Berstorff Maschinenbau GmbH: *See*—
Herbert, Adolf; Bellmer, Klaus; and Trocha, Jobst, 4,619,599, Cl. 425-186.000.

Hermann Finckh Maschinenfabrik GmbH & Co.: *See*—
Holz, Emil, 4,619,737, Cl. 162-357.000.

Herrington, F. John, to Mobil Oil Corporation. Splayed roll folder for adhesive application. 4,619,638, Cl. 493-439.000.

Herrington, Maurice G., to Payen International Limited. Cylinder head gaskets with aperture reinforcing means. 4,619,459, Cl. 277-235.00B.

Hertz, Carl H.; and Samuelsson, Bo A., to Hertz, Carl H. Method and apparatus for high resolution ink jet printing. 4,620,196, Cl. 346-1.100.

Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Barnes, James M., to Bayer Aktiengesellschaft. Process for the production of deactivated suspensions of finely-divided polyisocyanates in relatively high molecular weight compounds, deactivated suspensions and use thereof for the production of polyurethanes. 4,619,985, Cl. 528-49.000.

Hessberger, Gerhard; and Scherer, Michael, to Hans Zapfe. Sputtering system for cathode sputtering apparatus. 4,619,755, Cl. 204-298.000.

Hewlett-Packard Company: *See*—
Bland, Robert J., 4,620,108, Cl. 307-2.000.

Hibino, Noburo: *See*—
Kamada, Koh; Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,619,856, Cl. 428-143.000.

Higashi, Katsumi; and Takeshima, Sadao, to Jidosha Kiki Co., Ltd. Method and device for controlling power steering device. 4,619,338, Cl. 180-142.000.

High Resolution Television, Inc.: *See*—
Songer, Jimmie D., 4,620,217, Cl. 358-12.000.

Hijikata, Kenichi; Sugihara, Tadashi; and Komabayashi, Masashi, to Mitsubishi Kinzoku Kabushiki Kaisha. Sputtering target material and process for producing the same. 4,619,697, Cl. 75-230.000.

Hill, Charles; and Spector, George. Revolving magazine for pistols. 4,619,063, Cl. 42-7.000.

Hill, Mark L. Guard plate and method for automobile door handle. 4,619,123, Cl. 70-417.000.

Hill, Robert B., to EYE-D Development II Ltd. Fovea-centered eye fundus scanner. 4,620,318, Cl. 382-2.000.

Hills, Robert G., to Eastman Kodak Company. Transducer-to-medium stabilizing device at negative attack angle with respect to medium. 4,620,250, Cl. 360-102.000.

Hinkens, Harold, to AMF Incorporated. Adaptor for an electric timer. 4,619,489, Cl. 339-28.000.

Hino, Masaaki, to Kabushiki Kaisha Toshiba. Magnetic resonance imaging system. 4,620,153, Cl. 324-309.000.

Hioki, Susumu: *See*—
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.

Hira, Kazumi: *See*—
Muraishi, Masakazu; and Hira, Kazumi, 4,619,725, Cl. 156-182.000.

Hirai, Hiroyuki: *See*—
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kouzou; and Hirai, Hiroyuki, 4,619,888, Cl. 430-353.000.

Hirai, Koichi: *See*—
Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, 4,619,685, Cl. 71-78.000.

Hirano, Norimitsu: *See*—
Egami, Kazuhito; and Hirano, Norimitsu, 4,620,139, Cl. 318-254.000.

Hirasawa, Shigeki: *See*—
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, 4,619,316, Cl. 165-104.330.

Hirata, Mitsuteru: *See*—
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.

Hiroki, Eizo, to Agency of Industrial Science and Technology. Spike tire. 4,619,301, Cl. 152-210.000.

Hirose Electric Co., Ltd.: *See*—
Kikuta, Sigeru, 4,619,493, Cl. 339-91.00R.

Hirota, Tetsuro: *See*—
Suzaki, Masayuki; Hirota, Tetsuro; Kanno, Tetsuo; and Koguchi, Takeziro, 4,620,249, Cl. 360-99.000.

Hirschmeier, Manfred; and Kreitl, Josef, to MTU Motoren-und Turbinen-Union Muenchen GmbH. Method for chemically removing aluminum diffusion layers. 4,619,707, Cl. 134-3.000.

Hitachi Automotive Engineering Co., Ltd.: *See*—
Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, 4,619,595, Cl. 418-83.000.

Hitachi Denshi Kabusihiki Kaisha: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Hitachi, Ltd.: *See*—
Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, 4,619,595, Cl. 418-83.000.
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.
Fujii, Fumiaki, 4,620,239, Cl. 360-8.000.
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.
Kambara, Hideki; and Seki, Setsuko, 4,620,103, Cl. 250-440.100.
Mitani, Katsuya; Sano, Toshihiro; Nomura, Nobutaka; Numata, Kou; and Utino, Megumi, 4,620,273, Cl. 364-136.000.
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, 4,619,316, Cl. 165-104.330.
Sano, Yoshihiro; Iwatani, Fumio; Kubo, Takao; and Miki, Yoshiteru, 4,620,257, Cl. 361-68.000.
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.
Takita, Atsushi; Sugano, Akira; and Honda, Naganobu, 4,619,224, Cl. 122-451.00R.
Ushifusa, Nobuyuki; Ogihara, Satoru; and Nagayama, Kosei, 4,620,264, Cl. 361-414.000.
Yasue, Toshikazu; Mese, Michihiro; and Endo, Takeyuki, 4,620,316, Cl. 381-43.000.
Yoshinari, Takashi, 4,619,241, Cl. 123-620.000.

Hitachi Metals, Ltd.: *See*—
Suenaga, Makoto; Yano, Mitsuru; Ishihara, Yasuoki; and Ohtsuka, Kohki, 4,619,713, Cl. 148-3.000.

Hitomi, Mitsuo: *See*—
Ueda, Kazuhiko; Hitomi, Mitsuo; and Sasaki, Junzo, 4,619,226, Cl. 123-52.0MB.

Hoadley, Jonathan K.; and Freeman, Mark P., deceased (by Freeman, Helen M., executrix), to Dorr-Oliver. Electrofilter process using recirculating electrolyte. 4,619,747, Cl. 204-182.300.
Hodgson, John A. Electrode array for muscle stimulation and recording. 4,619,266, Cl. 128-639.000.
Hoechst Aktiengesellschaft: *See—*
Buhr, Gerhard, 4,619,998, Cl. 544-193.100.
Disselbeck, Dieter; and Vollrath, Hans-Peter, 4,619,317, Cl. 165-162.000.
Henning, Rainer; Urbach, Hansjorg; Teetz, Volker; and Becker, Reinhard, 4,620,012, Cl. 548-411.000.
Pliefke, Engelbert, 4,619,742, Cl. 204-34.000.
Scholz, Eugen, 4,619,900, Cl. 436-42.000.
Wingen, Rainer; Geissler, Ulrich; and Ruckert, Hans, 4,619,885, Cl. 430-260.000.
Hoecht Aktiengesellschaft: *See—*
Schmidbaur, Hubert; Dorzbach, Cornelia; and Bowmaker, Graham, 4,620,020, Cl. 556-18.000.
Hoffman, Karl K.: *See—*
Papciak, Walter A.; Hoffman, Karl K.; Engel, Roger; and Wieczorek, Adam, 4,620,247, Cl. 360-97.000.
Hoffmann, Arthur K.: *See—*
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,620,009, Cl. 548-155.000.
Hoffmann-La Roche Inc.: *See—*
Broger, Emil A.; and Crameri, Yvo, 4,620,013, Cl. 548-412.000.
Gotschi, Erwin; and Hubschwerlen, Christian, 4,619,787, Cl. 540-200.000.
Hofmann, Hans P.: *See—*
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.
Hofmeister, Helmut: *See—*
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Topert, Michael, 4,619,922, Cl. 514-180.000.
Hogg, James W., to Anchor Wire Corporation of Tennessee. Picture frame hanger. 4,619,430, Cl. 248-467.000.
Hojo, Yoshikata: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.
Holmes, Bruce J.; Martin, Glenn L.; Domack, Christopher S.; Obara, Clifford J.; and Hassan, Ahmed A., to United States of America, National Aeronautics and Space Administration. Geometries for roughness shapes in laminar flow. 4,619,423, Cl. 244-130.000.
Holstein und Kappert GmbH: *See—*
Kautz, Ralf-Dieter; and Stapelmann, Rolf, 4,619,133, Cl. 73-1.00R.
Holz, Emil, to Hermann Finckh Maschinenfabrik GmbH & Co. Roller for machines in the paper-making industry. 4,619,737, Cl. 162-357.000.
Holzhauer, Ralf: *See—*
Adrian, Willy; and Holzhauer, Ralf, 4,619,355, Cl. 198-323.000.
Homeyer, Bernhard: *See—*
Maurer, Fritz; and Homeyer, Bernhard, 4,619,918, Cl. 514-93.000.
Honda Giken Kogyo K.K.: *See—*
Yamanaka, Isao, 4,619,154, Cl. 74-489.000.
Honda Giken Kogyo Kabushiki Kaisha: *See—*
Hatanaka, Kaoru; and Miyamaru, Yukio, 4,620,177, Cl. 340-81.00R.
Hattori, Torao, 4,619,630, Cl. 474-72.000.
Kawasaki, Katsuyoshi, 4,619,476, Cl. 296-37.100.
Maezono, Masakazu; and Ishikawa, Keiichi, 4,619,350, Cl. 192-3.310.
Uesugi, Naomoto; and Suzuki, Shoji, 4,619,344, Cl. 181-229.000.
Honda, Naganobu: *See—*
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Honeywell Information Systems Inc.: *See—*
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,620,274, Cl. 364-200.000.
Honma, Nakahachiro: *See—*
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.
Hoogovens Groep B.V.: *See—*
Felthuis, Jacob; Van Laar, Jacobus; and Rengersen, Jacob, 4,619,441, Cl. 266-193.000.
Hooper, Robert C.; Verret, Douglas P.; and Roane, Bobby A., to Texas Instruments Incorporated. Method of plating an interconnect metal onto a metal in VLSI devices. 4,619,887, Cl. 430-313.000.
Hoover, Charles C.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,619,215, Cl. 114-56.000.
Hopkins, Thomas R., to Phillips Petroleum Company. Alcohol oxidase from Pichia-type yeasts. 4,619,898, Cl. 435-190.000.
Horejda, Natalie: *See—*
Dickey, Donna J.; Dobler, Sebastian; and Horejda, Natalie, 4,619,483, Cl. 297-397.000.
Horie, Seiji; Makino, Naonori; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Electrophotographic light sensitive material contains hydrazone compound. 4,619,880, Cl. 430-58.000.
Horie, Seiji: *See—*
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,619,881, Cl. 430-77.000.
Horie, Shigeru: *See—*
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,619,869, Cl. 428-480.000.
Horikawa, Toshihiro; and Kuwabara, Nobumori, to Matsushita Electric Industrial Co., Ltd. Floor coverings having built-in heater. 4,620,085, Cl. 219-528.000.
Horn, Gerald. Intraocular lens inserting assembly. 4,619,256, Cl. 128-303.00R.
Hornung, Karl-Otto: *See—*
Bachmann, Herbert; and Hornung, Karl-Otto, 4,619,444, Cl. 266-236.000.
Horton, Robert L., to Phillips Petroleum Company. Recovery of heavy metals from aqueous solutions. 4,619,744, Cl. 204-105.00R.
Horvath, Joseph L., to International Business Machines Corporation. Unitary slotted heat sink for semiconductor packages. 4,620,216, Cl. 357-81.000.
Hoshi, Hideaki; and Naito, Takayuki, to Bristol-Myers Company. 3-Propenyl cephalosporin derivatives. 4,619,925, Cl. 514-200.000.
Hoshi, Kinji: *See—*
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,619,730, Cl. 156-617.0SP.
Hoshino Butsusan Co., Ltd.: *See—*
Kou, Nagai, 4,619,189, Cl. 99-334.000.
Hoshizaki Electric Company, Ltd.: *See—*
Ito, Yoshinori, 4,619,117, Cl. 62-233.000.
Hoskin, Dennis H.: *See—*
Heilweil, Israel J.; and Hoskin, Dennis H., 4,619,773, Cl. 252-8.514.
Hosono, Akira: *See—*
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.
Hotta, Keiji, to Amikan Fishing Net Mfg. Co., Ltd. Multiple strand twines comprising monofilaments and multiple filaments, and fishnets formed thereof. 4,619,108, Cl. 57-236.000.
Hotta, Tadahiko; and Sakakibara, Shingo, to Nippon Gakki Seizo Kabushiki Kaisha. Method of manufacturing a semiconductor device including Schottky barrier diodes. 4,619,035, Cl. 29-576.00C.
Hougaard, Finn, to Eskofot A/S. Suction film holder. 4,619,526, Cl. 355-73.000.
Hougen, Everett Douglas: *See—*
Schmidt, John W., III, 4,619,532, Cl. 366-110.000.
Houlbrook, Kenneth; and Thornton, Paul A., to Clantex Limited. Dispensers for flowable compositions. 4,619,382, Cl. 222-327.000.
Houminer, Yoram: *See—*
Sanders, Edward B.; and Houminer, Yoram, 4,620,004, Cl. 544-357.000.
Houston, Theodore W., to Texas Instruments Incorporated. Schmitt trigger based memory cell with assisted turn on. 4,620,297, Cl. 365-174.000.
Howell, Edward K., to General Electric Company. Piezoelectric contact driver for circuit interrupters. 4,620,122, Cl. 310-328.000.
Hozelock-ASL Limited: *See—*
Goldney, Dennis G.; and Evans, Bryn, 4,619,403, Cl. 239-456.000.
Hrus, Miroslav; Svaty, Vladimir; Sidlof, Pavel; and Fisar, Oldrich, to Elitex, textilniho strojirenstvi. Weft inserting nozzle for jet looms. 4,619,296, Cl. 139-435.000.
Hsu, Chao-Yang, to Sun Refining and Marketing Company. Catalyst and process for production of cinnamates. 4,620,027, Cl. 560-104.000.
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, to Swiss Aluminium Ltd. Nozzle for strip casting. 4,619,309, Cl. 164-430.000.
Hubschwerlen, Christian: *See—*
Gotschi, Erwin; and Hubschwerlen, Christian, 4,619,787, Cl. 540-200.000.
Hudgens, Stephen J.: *See—*
Johncock, Annette G.; and Hudgens, Stephen J., 4,619,729, Cl. 156-606.000.
Huebner, John F.: *See—*
Schultz, Stephen J.; Huebner, John F.; Wiedor, Duane E.; and Pribish, Dennis S., 4,620,309, Cl. 373-128.000.
Huemer, Franz X. Circular loom. 4,619,293, Cl. 139-13.00R.
Hughes Aircraft Company: *See—*
Bagby, John P., 4,619,502, Cl. 350-505.000.
Hughes, Richard H.: *See—*
Morrell, Albert M.; Hughes, Richard H.; and Barkow, William H., 4,620,133, Cl. 315-15.000.
Hughes Tool Company: *See—*
Couch, Donald G., 4,619,324, Cl. 166-344.000.
Huizinga, Jan: *See—*
Dijkstra, Kees; and Huizinga, Jan, 4,619,119, Cl. 62-324.200.
Hundley, Lloyd: *See—*
Squires, David G.; Hundley, Lloyd; and Barry, Raymond A., 4,619,706, Cl. 134-2.000.
Hung, Yau Y.: *See—*
Haskell, Richard E.; and Hung, Yau Y., 4,620,223, Cl. 358-107.000.
Hunt, V. Bruce: *See—*
Lvovsky, Lazar; and Hunt, V. Bruce, 4,620,310, Cl. 375-17.000.
Hunziker, Christian: *See—*
Leuenberger, Rolf; and Hunziker, Christian, 4,619,527, Cl. 356-238.000.
Huss, Clifford A. Bingo chip dispenser. 4,619,376, Cl. 221-243.000.
Hussain, Saadat: *See—*
Sutker, Burton J.; Hussain, Saadat; and Mossaad, Amgad S., 4,619,961, Cl. 524-393.000.
Hussey, Richard P., to Aid-Pack, Inc. Disposable enema unit. 4,619,645, Cl. 604-111.000.

Hwang, Jennie S., to SCM Corporation. Fusible powdered metal paste. 4,619,715, Cl. 148-23.000.
Hwang, Philip. Portable type of foldable luggage cart. 4,619,464, Cl. 280-655.000.
Hydril Company: *See—*
Whiteman, Jack, 4,619,111, Cl. 60-632.000.
Hydro-Quebec: *See—*
Bolduc, Leonard, 4,620,144, Cl. 323-331.000.
I.P.E. Nuova Bialetti S.p.A. Industria Prodotti Elettrodomestici: *See—*
Cristante, Guido, 4,619,116, Cl. 62-233.000.
Iacobucci, Paul A.: *See—*
Cheng, Chung-Ping; Iacobucci, Paul A.; and Walsh, Edward N., 4,619,908, Cl. 502-214.000.
Ibaraki, Yoshiro: *See—*
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.
Ibbott, Jack K. Therapeutic method and therapeutic means using a sheetlike battery. 4,619,252, Cl. 128-82.100.
IC Gas International Limited: *See—*
Chalk, Christine D.; and Hayman, Cecil, 4,619,778, Cl. 252-70.000.
Ichida, Akito: *See—*
Yuki, Yoichi; and Ichida, Akito, 4,619,984, Cl. 528-38.000.
Ichihara, Shoichi: *See—*
Ono, Tetsuji; Ichihara, Shoichi; Ohta, Tomohisa; and Terui, Sadao, 4,619,909, Cl. 502-303.000.
Ichihashi, Tetsuo: *See—*
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,619,869, Cl. 428-480.000.
Ichikawa, Kouzo: *See—*
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.
Ichikawa, Osamu: *See—*
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Ichimura, Hiroshi: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, 4,620,221, Cl. 358-47.000.
Idaho Research Foundation, Inc.: *See—*
Taylor, Patrick R.; and Omofoma, Matthew A., 4,619,690, Cl. 75-1.00R.
Ide, Fumito, to Kabushiki Kaisha Toshiba. Monochromatic photocopying apparatus and method including color selection. 4,619,514, Cl. 355-3.00R.
Iimura, Ikurou; Sakuma, Kuniharu; and Iwabuchi, Haruo, to Tokyo Juki Industrial Co., Ltd. Drive control mechanism of sewing machine. 4,619,213, Cl. 112-273.000.
Iiyama, Kiyotaka; and Inaba, Nirohiko, to Ricoh Company, Ltd. Two-color thermosensitive recording material. 4,620,205, Cl. 346-204.000.
Iiyama, Kiyotaka: *See—*
Inaba, Norihiko; and Iiyama, Kiyotaka, 4,620,204, Cl. 346-204.000.
Ijiri, Yasuo: *See—*
Mio, Kotaro; and Ijiri, Yasuo, 4,619,852, Cl. 428-68.000.
Ikeda, Nobumasa: *See—*
Tokunaga, Seiichiro; and Ikeda, Nobumasa, 4,619,300, Cl. 152-209.00R.
Ikekawa, Nobuo: *See—*
DeLuca, Hector F.; Ikekawa, Nobuo; Kobayashi, Yoshiro; and Tanaka, Yoko, 4,619,920, Cl. 514-167.000.
Illinois Tool Works Inc.: *See—*
Ruehl, William E., 4,620,070, Cl. 179-175.30R.
Imagawa, Toshiyuki, to Clarion Co., Ltd. Automatic frequency control circuit in a stereo FM radio receiver. 4,620,315, Cl. 381-10.000.
Imai, Chikara, to Ricoh Company, Ltd. Dual mode image density controlling method. 4,619,522, Cl. 355-14.00D.
Imaizumi, Mamoru: *See—*
Tani, Zempei; Ebina, Kiyoshi; Ichikawa, Osamu; and Imaizumi, Mamoru, 4,620,094, Cl. 250-231.0SE.
IMEC Corporation: *See—*
Fulton, Donald E.; and Sassower, Stanley P., 4,620,272, Cl. 363-53.000.
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, to Mitsubishi Jukogyo Kabushiki Kaisha; and Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Structure for combustion chamber of auxiliary chamber type internal combustion engine. 4,619,229, Cl. 123-286.000.
Imperial Chemical Industries PLC: *See—*
Coffee, Ronald A., 4,619,438, Cl. 251-129.010.
Jackson, Samuel D., 4,619,947, Cl. 518-716.000.
Worthington, Paul A.; and Shephard, Margaret C., 4,620,011, Cl. 548-262.000.
Inaba, Nirohiko: *See—*
Iiyama, Kiyotaka; and Inaba, Nirohiko, 4,620,205, Cl. 346-204.000.
Inaba, Norihiko; and Iiyama, Kiyotaka, to Ricoh Company, Ltd. Two-color thermosensitive recording material. 4,620,204, Cl. 346-204.000.
Incorvia, Samuel A.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,619,673, Cl. 55-387.000.
Industrial Holographics, Inc.: *See—*
Haskell, Richard E.; and Hung, Yau Y., 4,620,223, Cl. 358-107.000.
Industrial Innovations, Inc.: *See—*
Urbani, William G., 4,619,015, Cl. 15-302.000.
Inenaga, Noriyasu: *See—*
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.
Ingenieursbureau Het Noorden B.V.: *See—*
Brink, Fredericus J., 4,619,728, Cl. 156-555.000.
Inoguchi, Hiroo: *See—*
Niki, Katsumi; Kobayashi, Katsuyoshi; Inoguchi, Hiroo; and Yagi, Tatsuhiko, 4,619,754, Cl. 204-290.00R.
Inoue, Hiroshi; Miyazaki, Makoto; Isoi, Masaaki; and Yoda, Makoto, to Toa Nenryo Kogyo Kabushiki Kaisha. Modified elastomer and laminate thereof. 4,619,972, Cl. 525-193.000.
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, to Sumitomo Electric Industries, Ltd. Catheter. 4,619,247, Cl. 128-6.000.
Inouye, Tamon, to Kabushiki Kaisha Toshiba. Imaging method and apparatus for obtaining spin-lattice relaxation time image utilizing nuclear magnetic resonance. 4,620,154, Cl. 324-309.000.
Institut Biokhimii I Fiziologii Mikroorganizmov Akademii Nauk SSR: *See—*
Nikitin, Vladimir A.; Khokhlov, Anatoly M.; Larin, Vyacheslav T.; and Fikhte, Boris A., 4,619,899, Cl. 435-287.000.
Institut Francais du Petrole: *See—*
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,619,762, Cl. 210-170.000.
Institute of Paper Chemistry, The: *See—*
Clay, David T.; and Cartwright, Timothy B., 4,619,732, Cl. 162-29.000.
International Business Machines Corporation: *See—*
Aiken, John A., Jr., 4,620,295, Cl. 364-900.000.
Bakken, Kirby L.; Judson, Robert G.; Miller, William E.; and Peterson, Ronald A., 4,620,243, Cl. 360-77.000.
Buttry, Daniel A.; Krounbi, Mohamad T.; and Melroy, Owen R., 4,619,731, Cl. 156-644.000.
Conner, David E., 4,620,187, Cl. 340-825.050.
Daniell, Thomas P.; Harding, Robert C., Jr.; Harvey, Roger W. R.; and Nauckhoff, Sven H. H., 4,620,276, Cl. 364-200.000.
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, 4,619,537, Cl. 400-225.000.
Garwin, Richard L.; and Thompson, David A., 4,620,253, Cl. 360-107.000.
Horvath, Joseph L., 4,620,216, Cl. 357-81.000.
International Computers Limited: *See—*
Martin, Sidney H., 4,619,488, Cl. 339-14.00R.
International Flavors & Fragrances Inc.: *See—*
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,619,780, Cl. 252-522.00R.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,620,041, Cl. 568-665.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; and Schreiber, William L., 4,619,781, Cl. 252-522.00R.
Wiegers, Wilhelmus J., 4,620,039, Cl. 568-445.000.
International Paper Company: *See—*
Crowe, Stephen O.; and Harper, Jeffrey D., 4,619,362, Cl. 206-326.000.
International Standard Electric Corporation: *See—*
Heeks, John S., 4,620,193, Cl. 342-200.000.
Zebisch, Manfred W., 4,620,091, Cl. 250-231.0SE.
Internationella Siporex AB: *See—*
Goransson, Rolf E.; and Kalvenes, Oystein, 4,619,173, Cl. 8.3-870.000.
Iomega Corporation: *See—*
Bauck, Randall C.; and Kleczkowski, Peter S., 4,620,252, Cl. 360-106.000.
Iosif, Baumberg. Device for diagnosing and monitoring urological diseases. 4,619,273, Cl. 128-771.000.
Isawa, Nobuyuki: *See—*
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,619,730, Cl. 156-617.0SP.
ISCA Management Limited: *See—*
McIntyre, Brian W.; and Biggar, John W., 4,619,608, Cl. 423-220.000.
Ishida, Takashi: *See—*
Auslander, David M.; Tomizuka, Masayoshi; Sagues, Paul; Ishida, Takashi; and Kamiyama, Shuichi, 4,619,237, Cl. 123-491.000.
Ishigo, Hideyasu: *See—*
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Ishihama, Hiroshi: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.
Ishihara, Yasuoki: *See—*
Suenaga, Makoto; Yano, Mitsuru; Ishihara, Yasuoki; and Ohtsuka, Kohki, 4,619,713, Cl. 148-3.000.
Ishii, Hiroshi: *See—*
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Ishii, Keizou; Kurauchi, Takeo; Nozue, Jun; and Ishikura, Shinichi, to Nippon Paint Co., Ltd. Dispersion stabilizer and its use. 4,619,965, Cl. 524-547.000.
Ishikawa, Hideyuki: *See—*
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.

Ishikawa, Hirotoshi; and Kiyobe, Seiichiro, to Kogawa Hokushin Electric Corporation. Microwave moisture sensor. 4,620,146, Cl. 324-58.50A.
Ishikawa, Keiichi: *See—*
Maezono, Masakazu; and Ishikawa, Keiichi, 4,619,350, Cl. 192-3.310.
Ishikawa, Masanobu: *See—*
Kazaoka, Kenichi; Ishikawa, Masanobu; and Nishikawa, Masumi, 4,619,548, Cl. 403-290.000.
Ishikawajima-Harima Jukogyo Kabushiki Kaisha: *See—*
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Ishikura, Shinichi: *See—*
Ishii, Keizou; Kurauchi, Takeo; Nozue, Jun; and Ishikura, Shinichi, 4,619,965, Cl. 524-547.000.
Ishikura, Tsukasa, to Nippon Kayaku Kabushiki Kaisha. Process for producing 2-quinoxalinols. 4,620,003, Cl. 544-354.000.
Ishikura, Yoshikazu; Watanabe, Akira; and Matsumoto, Takanao, to Sanyo Electric Co., Ltd. Preservation device for lead storage battery. 4,619,873, Cl. 429-48.000.
Ishimatsu, Toshiki: *See—*
Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, 4,619,698, Cl. 75-238.000.
Ishiyama, Gen: *See—*
Akabane, Hitoshi; and Ishiyama, Gen, 4,619,083, Cl. 51-289.00R.
Isii, Sigeki, to Nippon Gakki Seizo Kabushiki Kaisha. Automatic accompaniment apparatus for electronic musical instrument. 4,619,176, Cl. 84-1.030.
Isobe, Minoru, to Oki Electric Industry Co., Ltd. Paper tractor. 4,619,389, Cl. 226-79.000.
Isoi, Masaaki: *See—*
Inoue, Hiroshi; Miyazaki, Makoto; Isoi, Masaaki; and Yoda, Makoto, 4,619,972, Cl. 525-193.000.
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, to Mitsubishi Gas Chemical Company, Inc. Process for producing carboxylic acids. 4,620,033, Cl. 562-519.000.
Itek Corporation: *See—*
Dodge, Dennis W., 4,619,451, Cl. 271-274.000.
McCarthy, Clifton J., 4,620,240, Cl. 360-48.000.
Ito, Eizi, to Mitsubishi Denki Kabushiki Kaisha. Container for accommodating a control device. 4,620,263, Cl. 361-383.000.
Ito, Norifumi: *See—*
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.
Ito, Yoshinori, to Hoshizaki Electric Company, Ltd. Automatic ice making machine. 4,619,117, Cl. 62-233.000.
Itsuki, Noriyasu. Reclining device for a vehicle seat. 4,619,482, Cl. 297-355.000.
ITT Corporation: *See—*
Godwin, William R.; and Quattrocchi, Salvatore, 4,620,069, Cl. 179-175.30R.
Smith, Allen R.; Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,620,286, Cl. 364-513.000.
Iuchi, Tohru; and Tanaka, Fumio, to Nippon Steel Corporation. Interferometric contact-free measuring method for sensing motional surface deformation of workpiece subjected to ultrasonic wave vibration. 4,619,529, Cl. 356-358.000.
Ives, Jeffrey L., to Pfizer Inc. Peptide-substituted heterocyclic immunostimulants. 4,619,915, Cl. 514-17.000.
Iwabuchi, Haruo: *See—*
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Iwai, Shingo; Suzuki, Ryozo; Shiraga, Jun; and Okashiro, Tetsuo, to Mitsubishi Denki Kabushiki Kaisha. In-tank type fuel pump. 4,619,591, Cl. 417-422.000.
Iwai, Yasuyuki, to Konishiroku Photo Industry Co., Ltd. Reproducing apparatus. 4,619,516, Cl. 355-3.0DD.
Iwaki, Osamu: *See—*
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Iwamoto, Mune: *See—*
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Iwasaki, Kiyoshi: *See—*
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Iwasaki, Yoshiharu: *See—*
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
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Iwatani, Fumio: *See—*
Sano, Yoshihiro; Iwatani, Fumio; Kubo, Takao; and Miki, Yoshiteru, 4,620,257, Cl. 361-68.000.
Izzard, Derek S. Recovery apparatus. 4,619,411, Cl. 241-101.400.
Jachowski, Johannes; and Pant, Paul, to Fried Krupp GmbH. Process for the production of metallic semi-finished products. 4,619,692, Cl. 75-10.250.
Jackson, Bobby D.: *See—*
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,619,864, Cl. 428-240.000.
Jackson, Norman C., to Standard Products Company, The. Trim strip having injection molded finishing portion and method of making. 4,619,847, Cl. 428-31.000.
Jackson, Samuel D., to Imperial Chemical Industries PLC. Chemical process. 4,619,947, Cl. 518-716.000.
Jackson, Winston J., Jr.: *See—*
Morris, John C.; and Jackson, Winston J., Jr., 4,619,976, Cl. 525-439.000.
Jacobson, Mark E., to MLS, Inc. Boring bar. 4,619,564, Cl. 408-146.000.
Jaeggi, Christian: *See—*
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Jakusch, Helmut: *See—*
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Jalbing, John I.; and Carriere, Richard T., to General Motors Corporation. Catalytic converter substrate. 4,619,912, Cl. 502-439.000.
James C. Barber and Associates, Inc.: *See—*
Barber, James C., 4,619,819, Cl. 423-317.000.
Jamison Door Company: *See—*
Wiles, Vernon L., 4,619,075, Cl. 49-235.000.
Janning, John L., to NCR Corporation. Method of making laser recrystallized silicon-on-insulator nonvolatile memory device. 4,619,034, Cl. 29-571.000.
Jansen, Winfried; and Nolde, Wolfgang, to U.S. Philips Corporation. Method of generating an approximately sinusoidal signal and circuit arrangement for implementing this method, particularly in a stereo demodulator. 4,620,314, Cl. 381-4.000.
Janssen Pharmaceutica, N.V.: *See—*
Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., 4,619,931, Cl. 514-252.000.
Janthur, Ingo W.; Roth, Alfred; and Odry, Stefan, to General Motors Corporation. Adjustable shutter assembly and method of making the same. 4,619,073, Cl. 49-74.000.
Japan Tobacco & Salt Public Corporation, The: *See—*
Okumoto, Yutaka; Ozaki, Toshiyuki; and Komori, Mikio, 4,619,277, Cl. 131-94.000.
Jastrzebski, Lubomir L., to RCA Corporation. Fabricating of a CMOS FET with reduced latchup susceptibility. 4,619,033, Cl. 29-571.000.
Jautelat, Manfred: *See—*
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Jean Walterscheid GmbH: *See—*
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Jeneric Industries, Inc.: *See—*
Prasad, Arun, 4,619,810, Cl. 420-463.000.
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Jennings, Thomas J.: *See—*
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Jenoptik Jena G.m.b.H.: *See—*
Schlichting, Johannes; and Halwass, Kerstin, 4,620,089, Cl. 250-201.000.
Jensen Corporation: *See—*
May, Wayne A.; and Peters, Donald J., 4,619,358, Cl. 198-457.000.
Jensen, Dale H.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,619,215, Cl. 114-56.000.
Jeppson, Morris R., to CD High Technology, Inc. Microwave method and apparatus for heating loose paving materials. 4,619,550, Cl. 404-80.000.
Jidosha Kiki Co., Ltd.: *See—*
Higashi, Katsumi; and Takeshima, Sadao, 4,619,338, Cl. 180-142.000.
Mori, Kohei; and Suzuki, Haruo, 4,619,185, Cl. 91-369.00R.
Jimenez, Antonio: *See—*
Baruffa, Olindo; and Jimenez, Antonio, 4,619,214, Cl. 112-459.000.
John Morrell & Company: *See—*
Heckman, Sandy D., 4,619,047, Cl. 30-276.000.
Johncock, Annette G.; and Hudgens, Stephen J., to Energy Conversion Devices, Inc. Microwave method of making semiconductor members. 4,619,729, Cl. 156-606.000.
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Fischell, Robert E., 4,619,653, Cl. 604-891.000.
Johnson, David A. Safety device for firearms using removable magazines. 4,619,062, Cl. 42-70.110.
Johnson, Gerald T., Sr. Protective surround for packer wheels. 4,619,331, Cl. 172-518.000.
Johnson, James R. Closure strip to be applied to bags. 4,619,021, Cl. 24-30.50P.
Johnson, Kenneth A. Air diverter for supercharger. 4,619,590, Cl. 417-407.000.
Johnson, LeRoy B.: *See—*
Heimnick, Paul; and Johnson, LeRoy B., 4,619,478, Cl. 296-153.000.
Johnson, Marvin M.; and Nowack, Gerhard P., to Phillips Petroleum Company. Chromium phosphate catalyst. 4,619,907, Cl. 502-210.000.
Johnson, Marvin M.: *See—*
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Johnson, Robert D. Shim for adjusting camber. 4,619,465, Cl. 280-661.000.

Johnson, Robert R.: *See*—
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Johnson, Russell L.: *See*—
Sokolowski, Robert C.; and Johnson, Russell L., 4,619,862, Cl. 428-221.000.
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Lambert, Susan L.; Lawson, Randy J.; Johnson, Russell W.; and Barr, Tery L., 4,619,906, Cl. 502-66.000.
Johnston, Kenneth A., to Kenross Nominees Proprietary Limited. Reversible panel arrangement. 4,619,095, Cl. 52-595.000.
Jonason, Hans: *See*—
Sundberg, Bo; and Jonason, Hans, 4,619,222, Cl. 119-15.50R.
Jones, Brian W.: *See*—
Frick, John G., Jr.; Jones, Brian W.; Stone, Robbie L.; and Watson, Michael D., 4,619,668, Cl. 8-496.000.
Jones, Elvis E.; Pearce, Terry A.; Laird, Dacon C., III; and Everitt, James H., to Dow Chemical Company, The. Method for increased mine recovery and upgrading of lignite. 4,619,669, Cl. 44-1.00G.
Jones, Giffin D.; and Doorenbos, Harold E., to Dow Chemical Company, The. Eneynols from acetylenes and propargylic alcohols. 4,620,045, Cl. 568-873.000.
Jones, Howard: *See*—
Youssefyeh, Raymond D.; and Jones, Howard, 4,619,944, Cl. 514-513.000.
Jones, Kenneth W. Carton forming apparatus. 4,619,637, Cl. 493-175.000.
Jones, Robert S.: *See*—
Cook, Randall W.; Rozporka, Richard E.; and Jones, Robert S., 4,620,255, Cl. 360-132.000.
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Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.
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Juan, Hans; Bjerngren, Jan Å.; and Stromdahl, Carl Å., to Atlas Copco Aktiebolag. Device for removing degraded concrete. 4,619,551, Cl. 404-90.000.
Judson, Robert G.: *See*—
Bakken, Kirby L.; Judson, Robert G.; Miller, William E.; and Peterson, Ronald A., 4,620,243, Cl. 360-77.000.
Juergens, Albert M., Jr. Intraocular lens. 4,619,662, Cl. 623-6.000.
Jung, Fred C. Fishing planer line protector. 4,619,070, Cl. 43-43.130.
Justrite Manufacturing Company: *See*—
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Kabele, William C.: *See*—
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Kabushiki Kaisha Daikin Seisakusho: *See*—
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Kabushiki Kaisha Ishida Koki Seisakusho: *See*—
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Kabushiki Kaisha Johnan Seisakusho: *See*—
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Kabushiki Kaisha Naka Gijutsu Kenkyusho: *See*—
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Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho: *See*—
Teraoka, Fuminori; Matsui, Takeo; and Mori, Shinji, 4,619,417, Cl. 242-107.40A.
Kabushiki Kaisha Toshiba: *See*—
Fujiwara, Shigemi, 4,620,098, Cl. 250-327.200.
Hino, Masaaki, 4,620,153, Cl. 324-309.000.
Ide, Fumito, 4,619,514, Cl. 355-3.00R.
Inouye, Tamon, 4,620,154, Cl. 324-309.000.
Kanno, Ken-ichi; Gatayama, Tetsuya; Koyama, Masao; and Koezuka, Junji, 4,619,739, Cl. 204-1.00T.
Sumitani, Shigeto, 4,619,601, Cl. 431-1.000.
Taguchi, Shinji; Matsumura, Homare; and Maeguchi, Kenji, 4,619,037, Cl. 29-578.000.
Tanaka, Tatsuo; and Shigematsu, Nana, 4,620,161, Cl. 330-257.000.
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Yamamoto, Toshio, 4,619,396, Cl. 228-102.000.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
Suzuki, Kenichi; and Miura, Fusayoshi, 4,619,716, Cl. 148-26.000.
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Kageyama, Hidehei, to Kotobuki & Co, Ltd. Mechanical pencil equipped with lead-storing cartridge. 4,619,539, Cl. 401-85.000.
Kaku, Hiroyuki: *See*—
Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, to Hitachi, Ltd. Composite type photosensitive member having metal-free phthalocyanine in the charge generating layer and nonionic dye base in the charge transport layer. 4,619,879, Cl. 430-58.000.
Kalvenes, Oystein: *See*—
Goransson, Rolf E.; and Kalvenes, Oystein, 4,619,173, Cl. 8.3-870.000.
Kalvoda, Jaroslav; and Anner, Georg, to Ciba-Geigy Corporation. Polyhalogeno-steroids. 4,619,921, Cl. 514-180.000.
Kamada, Koh; Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,619,856, Cl. 428-143.000.
Kambara, Hideki; and Seki, Setsuko, to Hitachi, Ltd. Sample holder for mass analysis. 4,620,103, Cl. 250-440.100.
Kameya, Kazuo, to Elmec Corporation. Variable delay line having linking electrode with depressions therein for snug engagement of moveable contact. 4,620,164, Cl. 333-139.000.
Kameyama, Kazuhiro; and Akiba, Nobuo, to Casio Electronics Mfg. Co., Ltd.; and Casio Computer Co., Ltd. Two-color image forming apparatus. 4,619,518, Cl. 355-4.000.
Kamiguchi, Taiji: *See*—
Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.
Kaminaga, Hiromitsu, to Yoshida Kogyo K. K. Curtain wall panel supporting device. 4,619,092, Cl. 52-235.000.
Kamiyama, Shuichi: *See*—
Auslander, David M.; Tomizuka, Masayoshi; Sagues, Paul; Ishida, Takashi; and Kamiyama, Shuichi, 4,619,237, Cl. 123-491.000.
Kamiyama, Yoshiyasu; Yoshioka, Noriaki; and Nakagome, Keisuke, to Nitto Electric Industrial Co., Ltd. Composite semipermeable membrane. 4,619,767, Cl. 210-490.000.
Kamochi, Atsumi: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,619,688, Cl. 71-92.000.
Kampel, Marian: *See*—
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,619,805, Cl. 264-29.500.
Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, to Nissan Chemical Industries, Ltd. Process for controlling the growth of suckers on a tobacco plant. 4,619,685, Cl. 71-78.000.
Kanamori, Toshio: *See*—
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, 4,619,310, Cl. 164-448.000.
Kaneko, Norimasa: *See*—
Baba, Tadashi; and Kaneko, Norimasa, 4,619,614, Cl. 433-99.000.
Kanesaki, Katumi: *See*—
Kawai, Toshikazu; Nishimura, Ysunobu; and Kanesaki, Katumi, 4,620,042, Cl. 568-775.000.
Kanno, Ken-ichi; Gatayama, Tetsuya; Koyama, Masao; and Koezuka, Junji, to Kabushiki Kaisha Toshiba. Method and apparatus for measuring halogen ion concentration. 4,619,739, Cl. 204-1.00T.
Kanno, Tetsuo: *See*—
Suzaki, Masayuki; Hirota, Tetsuro; Kanno, Tetsuo; and Koguchi, Takeziro, 4,620,249, Cl. 360-99.000.
Kanou, Singi: *See*—
Kawanobe, Yasutaka; Noguti, Hisao; Kanou, Singi; and Yamazaki, Katsuya, 4,619,694, Cl. 75-59.140.
Kansas State University Research Foundation: *See*—
Bresee, Randall R.; and Reagan, Barbara M., 4,619,664, Cl. 8-128.00A.
Kanstad, Svein O.: *See*—
Nordal, Per-Erik; and Kanstad, Svein O., 4,620,104, Cl. 250-493.100.
Kapfer, Jurgen; and Kirchdorffer, Gerhard, to Dr. Ing. h.c.F. Porsche Aktiengesellschaft. Ignition distributor arrangement for integral-combustion engines. 4,619,227, Cl. 123-146.50A.
Kaplan, Mark S.: *See*—
Molaire, Michel F.; and Kaplan, Mark S., 4,619,890, Cl. 430-495.000.
Kappas, Attallah; and Drummond, George S., to Rockefeller University, The. Metal protoporphyrins in the control of tryptophan metabolism. 4,619,923, Cl. 514-185.000.
Kappeler, Franz, to Siemens Aktiengesellschaft. Semiconductor diode laser. 4,620,307, Cl. 372-50.000.
Kappelt, Charles E., Jr., to Molded Fiber Glass Company. PC board rack. 4,619,368, Cl. 211-41.000.
Karimoto, Hiroyasu: *See*—
Sakai, Ikuo; Karimoto, Hiroyasu; and Nakayama, Yasuhiko, 4,619,720, Cl. 148-403.000.
Karl M. Reich Maschinenfabrik GmbH: *See*—
Maurer, Werner, 4,619,393, Cl. 227-136.000.
Karl Mengele & Sohne GmbH & Co.: *See*—
Wistuba, Eberhard, 4,619,413, Cl. 241-222.000.

Karl Mengele & Sohne GmbH & Co. KG.: *See*—
Lenzer, Xaver; Wistuba, Eberhard; and Modinger, Hermann, 4,619,410, Cl. 241-55.000.
Karlotski, Robert J.: *See*—
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,620,125, Cl. 313-25.000.
Karr, Dennis K.; and Sprankle, David A., to North American Philips Corporation. Simple thermostat for dip mounting. 4,620,175, Cl. 337-343.000.
Karu, Alexander E.: *See*—
Cubicciotti, Roger S.; Karu, Alexander E.; and Krauss, Ronald M., 4,619,895, Cl. 435-7.000.
Kassai, Kenzou, to Aprica Kassai Kabushikikaisha. Baby carriage grip rod locking mechanism. 4,619,542, Cl. 403-62.000.
Kataoka, Ryuji, to Fuji Jukogyo Kabushiki Kaisha. Air-fuel ratio control system. 4,619,235, Cl. 123-440.000.
Katayama, Seiji: *See*—
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.
Kathari, Franz. Sheet dispenser. 4,619,375, Cl. 221-186.000.
Kato, Toshikazu, to Olympus Optical Co., Ltd. Cassette ejection mechanism of a cassette tape recorder. 4,620,246, Cl. 360-96.500.
Kato, Yoshiaki: *See*—
Nakatani, Kaname; and Kato, Yoshiaki, 4,620,203, Cl. 346-153.100.
Kato, Yoshio: *See*—
Numaho, Yoshio; Kato, Yoshio; Okada, Hiroshi; and Ogawa, Tetsuro, 4,620,137, Cl. 315-378.000.
Katoh, Yoshiharu: *See*—
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Katsube, Junki: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,620,036, Cl. 564-256.000.
Katz, Ellis, to Rockwell International Corporation. Torqueless fluid connector. 4,619,290, Cl. 138-39.000.
Kautz, Ralf-Dieter; and Stapelmann, Rolf, to Holstein und Kappert GmbH. System for checking inspection machines. 4,619,133, Cl. 73-1.00R.
Kawabe, Kiyoshi: *See*—
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
Kawada, Kaoru: *See*—
Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, 4,619,698, Cl. 75-238.000.
Kawaguchi, Katsuhiko: *See*—
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Kawai, Naoyuki: *See*—
Ohta, Kimihiro; Nakagawa, Tadashi; Kawai, Naoyuki; Kojima, Takeshi; and Kawashima, Mitsuo, 4,620,206, Cl. 357-4.000.
Kawai, Toshikazu; Nishimura, Ysunobu; and Kanesaki, Katumi, to Central Glass Company, Limited. Preparation of 2-chloro-4-fluorophenol from 4-fluorophenol. 4,620,042, Cl. 568-775.000.
Kawakami, Hajime: *See*—
Ono, Keiichi; Kawakami, Hajime; and Katsube, Junki, 4,620,036, Cl. 564-256.000.
Kawanobe, Yasutaka; Noguti, Hisao; Kanou, Singi; and Yamazaki, Katsuya, to Daido Tokusyuko K.K.; and Yahagi Engineering K.K. Method of refining steel and apparatus. 4,619,694, Cl. 75-59.140.
Kawasaki, Katsuyoshi, to Honda Giken Kogyo Kabushiki Kaisha. Expandable storage systems for small vehicles. 4,619,476, Cl. 296-37.100.
Kawashima, Mitsuo: *See*—
Ohta, Kimihiro; Nakagawa, Tadashi; Kawai, Naoyuki; Kojima, Takeshi; and Kawashima, Mitsuo, 4,620,206, Cl. 357-4.000.
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kouzou; and Hirai, Hiroyuki, to Fuji Photo Film Co., Ltd. Heat developable light-sensitive material. 4,619,888, Cl. 430-353.000.
Kawawa, Takaho, to Nippon Kokan Kabushiki Kaisha. Mold for horizontally and continuously casting molten metal into cast metal strand. 4,619,308, Cl. 164-416.000.
Kawneer Company, Inc.: *See*—
Trummer, Joseph A.; and Coulston, El L., 4,619,097, Cl. 52-730.000.
Kayata, Haruhiko: *See*—
Tatsumi, Hisao; Kayata, Haruhiko; and Watanabe, Fumio, 4,620,199, Cl. 346-76.0PH.
Kazaoka, Kenichi; Ishikawa, Masanobu; and Nishikawa, Masumi, to Aisin Seiki Kabushiki Kaisha. Telescopic shaft. 4,619,548, Cl. 403-290.000.
KB Elverskog Ide & Konstruktion: *See*—
Elverskog, Bernt, 4,619,623, Cl. 441-126.000.
KCL Corporation: *See*—
Sullivan, Brian, 4,620,320, Cl. 383-79.000.
Keates, Richard H.; Schneider, Richard T.; Roxey, Timothy E.; and Cox, John D. Flexible intraocular lens holder. 4,619,657, Cl. 623-6.000.
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., to GTE Products Corporation. Low wattage metal halide lamp with inverted domed sleeve. 4,620,125, Cl. 313-25.000.
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., to GTE Products Corporation. Electrode alignment and capsule design for single-ended low wattage metal halide lamps. 4,620,130, Cl. 313-634.000.
Keem, John E.; and Flasck, James D., to Energy Conversion Devices, Inc. Multilayer coating and method. 4,619,865, Cl. 428-333.000.
Keene, Douglas L.: *See*—
Traino, James C.; and Keene, Douglas L., 4,620,237, Cl. 358-300.000.
Keese, Charles R.: *See*—
Giaever, Ivar; and Keese, Charles R., 4,619,904, Cl. 436-518.000.
Keifer, Terry A., to Check Mate Systems, Inc. Security apparatus for retail goods. 4,620,182, Cl. 340-568.000.
Keiper Recaro, Inc.: *See*—
Loewe, Gerhard; Nithammer, Egon; and Zaveri, Vikram, 4,619,031, Cl. 29-434.000.
Keller, Teddy M., to United States of America, Navy. Epoxy phthalonitrile polymers. 4,619,986, Cl. 528-99.000.
Kelley Company, Inc.: *See*—
Kovach, Jonathan W.; and Hageman, Martin P., 4,619,008, Cl. 14-71.700.
Kells Medical, Inc.: *See*—
Sheehan, Joseph C. M.; and Dorr, Bruce P., 4,620,319, Cl. 383-33.000.
Kelly, Dean A.; and Brann, Strother H., to Alca Enterprises, Inc. Box and fastener for stacking. 4,619,365, Cl. 206-503.000.
Kendall Company, The: *See*—
Rath, Lucien M.; and Dunn, William J., 4,619,648, Cl. 604-326.000.
Kendrick, Barnes R., Jr.: *See*—
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, 4,619,537, Cl. 400-225.000.
Kennedy, Conrad P., Jr.; and Kennedy, Harry L., to Gibson, Patrick Howard. Materials handling and weighing apparatus. 4,619,359, Cl. 198-463.500.
Kennedy, Harry L.: *See*—
Kennedy, Conrad P., Jr.; and Kennedy, Harry L., 4,619,359, Cl. 198-463.500.
Kennedy, Leo D. Solid and liquid waste incinerator system. 4,619,210, Cl. 110-234.000.
Kennedy, T. Scott; and Herman, Paul F., to Twin Rivers Engineering. Composite active filter material. 4,619,948, Cl. 521-52.000.
Kenney Manufacturing Company: *See*—
Comeau, Paul E., 4,619,305, Cl. 160-263.000.
Kenney, Timothy J.: *See*—
Radzins, Edmund; and Kenney, Timothy J., 4,619,357, Cl. 198-412.000.
Kenny, Patrick M., to Hen-Jac, Inc. Embedment anchor. 4,619,218, Cl. 114-295.000.
Kenrick, C. Robert. Assembly method and apparatus. 4,619,103, Cl. 53-432.000.
Kenross Nominees Proprietary Limited: *See*—
Johnston, Kenneth A., 4,619,095, Cl. 52-595.000.
Keri, Eva: *See*—
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela, 4,619,936, Cl. 514-282.000.
Keritsis, Gus D.: *See*—
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
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Fremery, Johan K.; Lindenau, Bernd; and Witthauer, Klaus, 4,619,144, Cl. 73-708.000.
Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See*—
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,619,805, Cl. 264-29.500.
Kerr, Charles, III; and Forell, Mark. Method of making improved electroluminescent panels. 4,619,624, Cl. 445-22.000.
Kessler, Bayard F.; and Nagy, Neil F., to Novation, Inc. Pocket sized telephone line data communication systems. 4,620,064, Cl. 179-2.00C.
Khokhlov, Anatoly M.: *See*—
Nikitin, Vladimir A.; Khokhlov, Anatoly M.; Larin, Vyacheslav T.; and Fikhte, Boris A., 4,619,899, Cl. 435-287.000.
Kidani, Morio. Grinding machine for ball end mills with helical cutter teeth. 4,619,079, Cl. 51-165.710.
Kielbania, Andrew J.; and Kim, Samuel S., to Rohm and Haas Company. Stabilized aqueous copolymer dispersions. 4,619,964, Cl. 524-460.000.
Kijima, Yasuhiko: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,620,033, Cl. 562-519.000.
Kikuta, Sigeru, to Hirose Electric Co., Ltd. Connecting and engaging fixture for electric connector. 4,619,493, Cl. 339-91.00R.
Kim, Nack-Joon: *See*—
Thomas, Gareth; Ahn, Jae-Hwan; and Kim, Nack-Joon, 4,619,714, Cl. 148-12.00B.
Kim, Samuel S.: *See*—
Kielbania, Andrew J.; and Kim, Samuel S., 4,619,964, Cl. 524-460.000.
Kimberly-Clark Corporation: *See*—
Sokolowski, Robert C.; and Johnson, Russell L., 4,619,862, Cl. 428-221.000.
Kimble, James B.; and Kolts, John H., to Phillips Petroleum Company. Methane conversion. 4,620,057, Cl. 585-500.000.
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., to Phillips Petroleum Company. Ore flotation agent from 2-mercap-

tobenzimidazole and flotation processes therewith. 4,619,760, Cl. 209-166.000.

Kimmel, Arthur T.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Kimura, Hitoshi: *See*—
Yoshimura, Shigeo; Shimada, Yoshiaki; and Kimura, Hitoshi, 4,619,147, Cl. 73-862.380.

Kimura, Takashi, to Nippon Joucomatic Co., Ltd. Pneumatic cylinder device with locking mechanism. 4,619,188, Cl. 92-26.000.

King, Michael T., to D&K Custom Machine Design, Inc. Cutter mechanism for laminate slitting machine. 4,619,169, Cl. 83-697.000.

Kinoshita, Yoshio: *See*—
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, 4,619,352, Cl. 192-41.00A.

Kinzler, Hans, to Siemens Aktiengesellschaft. Electrical suppressor filter. 4,620,165, Cl. 333-167.000.

Kioritz Corporation: *See*—
Baba, Toru, 4,619,105, Cl. 56-12.700.

Kirchdorffer, Gerhard: *See*—
Kapfer, Jurgen; and Kirchdorffer, Gerhard, 4,619,227, Cl. 123-146.50A.

Kirchner, Edward C.; and DeFoe, Ronald J., to Beloit Corporation. Multi-disk refiner. 4,619,414, Cl. 241-261.300.

Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, to Teijin Limited. Biaxially oriented polyester film. 4,619,869, Cl. 428-480.000.

Kirkland, Donald R.; and Morcom, Paul J. Float release devices. 4,619,066, Cl. 43-25.000.

Kirouac, J. Paul: *See*—
Szmuk, Szilvia; Kirouac, J. Paul; and Feist, Betsy, 4,619,399, Cl. 229-72.000.

Kiryu, Yuichi, to Mitsubishi Denki Kabushiki Kaisha. Harmonic gear apparatus. 4,619,156, Cl. 74-640.000.

Kishi, Atsuo: *See*—
Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, 4,619,595, Cl. 418-83.000.

Kishi, Yuriko: *See*—
Miyamoto, Shigehiko; Watanabe, Yoshinobu; and Kishi, Yuriko, 4,620,197, Cl. 346-1.100.

Kistner, John F., to Minnesota Mining and Manufacturing Company. Abrasion resistant coatings. 4,619,949, Cl. 522-170.000.

Kita, Yasuhiro: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Kita, Yuzo: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Kitagawa Industries Co., Ltd.: *See*—
Matsui, Kazuhiro; and Sugiura, Haruyuki, 4,619,431, Cl. 248-500.000.

Kitzinger, Frank: *See*—
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., 4,619,533, Cl. 374-141.000.

Kiyobe, Seiichiro: *See*—
Ishikawa, Hirotoshi; and Kiyobe, Seiichiro, 4,620,146, Cl. 324-58.50A.

Kiyohara, Shuichi, to Canon Kabushiki Kaisha. AD conversion device for camera. 4,619,512, Cl. 354-458.000.

Kiyota, Yuhiko: *See*—
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.

Klauke, Erich: *See*—
Marhold, Albrecht; and Klauke, Erich, 4,620,018, Cl. 549-362.000.

Kleczkowski, Peter S.: *See*—
Bauck, Randall C.; and Kleczkowski, Peter S., 4,620,252, Cl. 360-106.000.

Klemm, Gerhard. Apparatus for drying sheet- or web-like materials with ultraviolet radiation. 4,619,050, Cl. 34-4.000.

Klisch, Leo M., to Minnesota Mining and Manufacturing Company. Cutting mechanism. 4,619,168, Cl. 83-694.000.

Klockner-Humboldt-Deutz AG: *See*—
Herchenbach, Horst; and Ramesohl, Hubert, 4,619,605, Cl. 432-14.000.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—
Wallenfang, Gerd; Rizk, Reda; and Michels, Hans-Gottfried, 4,619,239, Cl. 123-506.000.

Kluth, Hermann: *See*—
Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, 4,619,711, Cl. 134-38.000.

KMW Aktiebolag: *See*—
Andersson, Ingmar A., 4,619,734, Cl. 162-111.000.

Kneib, Rudi; Emmer, Ludwig; and Robitschko, Peter, to Daimler-Benz Aktiengesellschaft. Motor vehicle door interior lining equipped with a storage pocket. 4,619,477, Cl. 296-37.130.

Knight, John R.; and Thwaites, Geoffrey R., to W. R. Grace & Co. Compositions and methods for sealing containers. 4,619,848, Cl. 428-35.000.

Knight, Raymond P.: *See*—
Donaldson, Timothy P.; Knight, Raymond P.; and Shepheard, John R., 4,620,135, Cl. 315-326.000.

Knipstein, Richard A.: *See*—
Lay, George E.; Knipstein, Richard A.; and Haigh, Daniel H., 4,619,826, Cl. 424-78.000.

Knispel, Barry; and Wingert, Rudolf, to Arrow Fastener Company, Inc. Riveting attachment for a staple gun. 4,619,394, Cl. 227-156.000.

Knoll, Frank: *See*—
Spinosa, Dominic J.; and Knoll, Frank, 4,619,255, Cl. 128-202.270.

Knoll International, Inc.: *See*—
Hannah, Bruce R.; McClanahan, David D.; and Denny, Lee, 4,619,486, Cl. 312-195.000.

Knothe, Erich: *See*—
Behrend, Lothar; Ober, Jurgen; Knothe, Erich; and Melcher, Franz-Josef, 4,619,337, Cl. 177-210.00R.

Knowlton, Leland P. Plow coupling. 4,619,060, Cl. 37-231.000.

Kobayashi, Akira: *See*—
Arata, Yoshiaki; and Kobayashi, Akira, 4,620,080, Cl. 219-121.0PP.

Kobayashi, Hiroyuki: *See*—
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.

Kobayashi, Katsuyoshi: *See*—
Niki, Katsumi; Kobayashi, Katsuyoshi; Inoguchi, Hiroo; and Yagi, Tatsuhiko, 4,619,754, Cl. 204-290.00R.

Kobayashi, Masahito: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Kobayashi, Yoshiro: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; Kobayashi, Yoshiro; and Tanaka, Yoko, 4,619,920, Cl. 514-167.000.

Kocher, Kenneth E. Refillable pressure spray container. 4,619,297, Cl. 141-20.000.

Kodama, Shun-ichi: *See*—
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,619,983, Cl. 526-247.000.

Koehn, Dennis. Portable corral for cattle and the like. 4,619,223, Cl. 119-20.000.

Koezuka, Junji: *See*—
Kanno, Ken-ichi; Gatayama, Tetsuya; Koyama, Masao; and Koezuka, Junji, 4,619,739, Cl. 204-1.00T.

Kogawa Hokushin Electric Corporation: *See*—
Ishikawa, Hirotoshi; and Kiyobe, Seiichiro, 4,620,146, Cl. 324-58.50A.

Koguchi, Takeziro: *See*—
Suzaki, Masayuki; Hirota, Tetsuro; Kanno, Tetsuo; and Koguchi, Takeziro, 4,620,249, Cl. 360-99.000.

Kohama, Shigeo: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,619,688, Cl. 71-92.000.

Kohler, Franz: *See*—
Eblen, Otto; Glockler, Gerhard; Kohler, Franz; and Meinusch, Norbert, 4,620,195, Cl. 346-1.100.

Kohno, Akiomi: *See*—
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, 4,619,316, Cl. 165-104.330.

Koide, Hiroshi, to Ricoh Company, Ltd. Recording disk drive unit. 4,620,301, Cl. 369-266.000.

Kojima, Gen: *See*—
Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,619,983, Cl. 526-247.000.

Kojima, Takeshi: *See*—
Ohta, Kimihiro; Nakagawa, Tadashi; Kawai, Naoyuki; Kojima, Takeshi; and Kawashima, Mitsuo, 4,620,206, Cl. 357-4.000.

Kolb, Dieter: *See*—
Rostin, Gunther; Scheer, Erich; Kolb, Dieter; and Werner, Karl H., 4,619,354, Cl. 192-89.00B.

Kolecki, Ronald E., to Atlantic Richfield Co. Lubricant removal system for cold rolling stand. 4,619,126, Cl. 72-38.000.

Kolstad, Robert B.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Kolts, John H.; and Delzer, Gary A., to Philips Petroleum Company. Dehydrogenation and cracking of C_3 and C_4 hydrocarbons to less saturated hydrocarbons. 4,620,051, Cl. 585-663.000.

Kolts, John H.; and Delzer, Gary A., to Phillips Petroleum Company. Dehydrogenation and cracking of C_3 and C_4 hydrocarbons. 4,620,052, Cl. 585-663.000.

Kolts, John H.: *See—*
Kimble, James B.; and Kolts, John H., 4,620,057, Cl. 585-500.000.
Komabayashi, Masashi: *See—*
Hijikata, Kenichi; Sugihara, Tadashi; and Komabayashi, Masashi, 4,619,697, Cl. 75-230.000.
Komaki, Syojiro: *See—*
Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, 4,620,102, Cl. 250-427.000.
Komori, Mikio: *See—*
Okumoto, Yutaka; Ozaki, Toshiyuki; and Komori, Mikio, 4,619,277, Cl. 131-94.000.
Kondo, Mitsuru: *See—*
Ogawa, Mutsuo; Hashimoto, Takemi; Hara, Kazuyuki; and Kondo, Mitsuru, 4,620,233, Cl. 358-260.000.
Kondo, Takao: *See—*
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,620,033, Cl. 562-519.000.
Kondoh, Motoya, to Nippon Gakki Seizo Kabushiki Kaisha. Stop angle controller for a vibrato mechanism on a vibraphone. 4,619,178, Cl. 84-410.000.
Konicek, Tim R., to S. C. Johnson & Son, Inc. Automatic door-activated air freshener. 4,619,383, Cl. 222-556.000.
Koniger, Max: *See—*
Winterling, Gerhard; and Koniger, Max, 4,620,058, Cl. 136-258.000.
Konishi, Tadashi: *See—*
Saiki, Noritsugu; and Konishi, Tadashi, 4,619,987, Cl. 528-274.000.
Konishiroku Photo Industry Co., Ltd.: *See—*
Iwai, Yasuyuki, 4,619,516, Cl. 355-3.0DD.
Nakanishi, Kazuhiro, 4,619,510, Cl. 354-173.100.
Koniuk, Wayne A. Boot accessory. 4,619,059, Cl. 36-132.000.
Kooi, Boon-Lam. Pollution free pulping process using recycled wash effluent from multiple bleach stages to remove black liquor and recovering sodium hydroxide from the black liquor. 4,619,733, Cl. 162-30.100.
Kopfer, Rudolph J.; and Smith, Robert E. Anti-aerosoling drug reconstitution device. 4,619,651, Cl. 604-415.000.
Kopp, Richard: *See—*
Hess, Heinrich; Grogler, Gerhard; Kopp, Richard; and Barnes, James M., 4,619,985, Cl. 528-49.000.
Koppers Company, Inc.: *See—*
Franzen, Rune G., 4,619,761, Cl. 209-250.000.
Kosciuczyk, Theodore E.: *See—*
Cook, Stephen F.; Fisher, Harland S.; and Kosciuczyk, Theodore E., 4,619,726, Cl. 156-366.000.
Kosonocky, Walter F., to RCA Corporation. CCD imager with photodetector bias introduced via the CCD register. 4,620,231, Cl. 358-213.000.
Koster, Eberhard: *See—*
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.
Koszegi, Bela: *See—*
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela, 4,619,936, Cl. 514-282.000.
Kotch, Robert J.: *See—*
Daly, Jeffery E.; and Kotch, Robert J., 4,619,534, Cl. 384-94.000.
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., to Minnesota Mining and Manufacturing Company. Continuous free radial polymerization in a wiped-surface reactor. 4,619,979, Cl. 526-88.000.
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, to Seiko Epson Kabushiki Kaisha. Ink jet printer of the ink-on-demand type. 4,620,202, Cl. 346-140.00R.
Kotobuki & Co, Ltd.: *See—*
Kageyama, Hidehei, 4,619,539, Cl. 401-85.000.
Kottelman, Sanders. Alarm assembly for jewelery-type display case. 4,620,183, Cl. 340-568.000.
Kotzlowski, Heinz E., to Max-Planck-Gesellschaft Zur Foerderung der Wisenschaften E.V. Heat shield. 4,619,807, Cl. 376-136.000.
Kou, Nagai, to Hoshino Butsusan Co., Ltd. Apparatus for manufacturing boiled noodles. 4,619,189, Cl. 99-334.000.
Kovach, Jonathan W.; and Hageman, Martin P., to Kelley Company, Inc. Dockboard construction. 4,619,008, Cl. 14-71.700.
Kovacs, Sandor, to Vasipari Kutato es Fejleszto Vallalat. Electromechanical apparatus for conversion of force to electric signal. 4,619,148, Cl. 73-862.620.
Kovalan, Mark A.: *See—*
Fisher, Jimmie L.; Kovalan, Mark A.; and Wiscons, Bryon L., 4,620,277, Cl. 364-200.000.
Kowa Co., Ltd.: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.
Koyama, Masao: *See—*
Kanno, Ken-ichi; Gatayama, Tetsuya; Koyama, Masao; and Kozuka, Junji, 4,619,739, Cl. 204-1.00T.
Koyo Jidoki Kabushiki Kaisha: *See—*
Futaba, Takeshi, 4,619,155, Cl. 74-498.000.
Futaba, Takeshi; and Noguchi, Masahiko, 4,619,339, Cl. 180-143.000.
Koyo Seiko Company Limited: *See—*
Mitumaru, Mititosi, 4,619,458, Cl. 277-24.000.
Koziol, Konrad; and Wenk, Erich, to Conradty GmbH & Co. Metallelektroden KG. Electrode for electrolytic extraction of metals or metal oxides. 4,619,752, Cl. 204-286.000.
Kozono, Haruo; and Arakawa, Isao, to Nippon Steel Corporation. Pipe coupling. 4,619,472, Cl. 285-334.000.
Krabetz, Richard; and Engelbach, Heinz, to BASF Aktiengesellschaft. Production of acrylic acid by oxidation of acrolein. 4,620,035, Cl. 562-534.000.
Krasko, Zeya K.: *See—*
Keeffe, William M.; Krasko, Zeya K.; and Karlotski, Robert J., 4,620,125, Cl. 313-25.000.
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,620,130, Cl. 313-634.000.
Kratzenberg, Wolfgang, to Wegmann & Co. GmbH. Equipment for monitoring combat vehicles, especially tanks. 4,619,615, Cl. 434-22.000.
Kratzer, Bernd: *See—*
Daniels, Erwin J.; Kratzer, Bernd; and Schurle, Hermann, 4,619,504, Cl. 351-163.000.
Krause, Charles A.; and Rajaram, Babu, to Zenith Electronics Corporation. Multi-bit write feature for video RAM. 4,620,186, Cl. 340-703.000.
Krause, James N., to Seagate Technology. Compensation method to correct thermally induced off-track errors in disc drives. 4,620,244, Cl. 360-77.000.
Krauss, Ronald M.: *See—*
Cubicciotti, Roger S.; Karu, Alexander E.; and Krauss, Ronald M., 4,619,895, Cl. 435-7.000.
Krebs, David R.: *See—*
Schreiner, Peter J.; Bolenbaugh, Daniel L.; and Krebs, David R., 4,619,347, Cl. 188-72.600.
Kreeger, Elsmer W., to Pinckney Molded Plastics, Inc. Two-level stacking container. 4,619,366, Cl. 206-507.000.
Kreiskott, Horst: *See—*
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.
Kreitl, Josef: *See—*
Hirschmeier, Manfred; and Kreitl, Josef, 4,619,707, Cl. 134-3.000.
Kreitlow, Gerhard: *See—*
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, 4,619,253, Cl. 218-156.000.
Kresge, Edward N.: *See—*
Ver Strate, Gary W.; Graessley, William W.; and Kresge, Edward N., 4,620,048, Cl. 585-10.000.
Kreuzer, Franz-Heinrich; and Gebauer, Helmut, to Consortium fur Elektrochemische Industrie GmbH. Method for preparing hexamethylcyclotrisiloxane and uses for the same. 4,620,023, Cl. 556-460.000.
Krounbi, Mohamad T.: *See—*
Buttry, Daniel A.; Krounbi, Mohamad T.; and Melroy, Owen R., 4,619,731, Cl. 156-644.000.
Krueger, Walter L.: *See—*
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., 4,619,979, Cl. 526-88.000.
Kruger, Hans: *See—*
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,619,500, Cl. 350-341.000.
Kubo, Takao: *See—*
Sano, Yoshihiro; Iwatani, Fumio; Kubo, Takao; and Miki, Yoshiteru, 4,620,257, Cl. 361-68.000.
Kubota Ltd.: *See—*
Yoshimura, Shigeo; Shimada, Yoshiaki; and Kimura, Hitoshi, 4,619,147, Cl. 73-862.380.
Kubota, Yuichi: *See—*
Nakayama, Masatoshi; Morita, Haruyuki; and Kubota, Yuichi, 4,619,861, Cl. 428-220.000.
Kuchenmeister, Rolf: *See—*
Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, 4,619,966, Cl. 524-589.000.
Kuenn, Cary K.; Young, Jean M.; and Wundrock, John A., to Badger Pharmacal, Inc. Disposer cleaner. 4,619,710, Cl. 134-22.170.
Kuhnel, Frank, to VDO Adolf Schindling AG. Circuit arrangement for the electrothermal measurement of level. 4,619,140, Cl. 73-295.000.
Kulhanek, Antonin: *See—*
Porta, Augusto; and Kulhanek, Antonin, 4,619,745, Cl. 204-151.000.
Kulicke and Soffa Industries, Inc.: *See—*
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., 4,619,395, Cl. 228-4.500.
Kulzer & Co. GmbH: *See—*
Angrick, Michael; and Spath, Martin-Willi, 4,619,701, Cl. 106-38.230.
Kume, Satoru: *See—*
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.
Kummer, Robert F. Boat trailer light de-energization means. 4,620,109, Cl. 307-10.0LS.
Kummer, Rudolf; and Schwirten, Kurt, to BASF Aktiengesellschaft. Manufacture of higher alkylcarboxylic acids. 4,619,790, Cl. 260-413.000.
Kunieda, Hisashi: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.

Kunker, Don: *See*—
Bingeder, Peter P.; Whitacre, James B.; and Kunker, Don, 4,620,302, Cl. 371-1.000.

Kuraray Co., Ltd.: *See*—
Anzawa, Haruyoshi; Satoh, Kenji; Tanaka, Yoshinari; and Okaya, Takuji, 4,619,849, Cl. 428-35.000.

Kurauchi, Takeo: *See*—
Ishii, Keizou; Kurauchi, Takeo; Nozue, Jun; and Ishikura, Shinichi, 4,619,965, Cl. 524-547.000.

Kurek, Stanley. Wrenching unit for use in power threading of a sleeve portion to a pipe portion used in makeup of oil well casings or the like. 4,619,159, Cl. 81-57.340.

Kuriyama, Takashi: *See*—
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, 4,620,221, Cl. 358-47.000.

Kuroki, Masami: *See*—
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.

Kurrasch, Andrew J., to Herman Miller, Inc. Work surface height adjustment mechanism. 4,619,208, Cl. 108-144.000.

Kurt Wolf & Co. KG: *See*—
Andre, Wolfram K., 4,620,083, Cl. 219-491.000.

Kurtz, Leonard D.; and LiCausi, Joseph M., to BioResearch Inc. Surgical drainage apparatus. 4,619,647, Cl. 604-318.000.

Kushida, Takeo: *See*—
Oshizawa, Hidekazu; and Kushida, Takeo, 4,620,260, Cl. 361-152.000.

Kusumoto, Yasuo: *See*—
Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, 4,620,102, Cl. 250-427.000.

Kuttenbaum, Valentin. Frame assembly. 4,619,545, Cl. 403-169.000.

Kuwabara, Nobumori: *See*—
Horikawa, Toshihiro; and Kuwabara, Nobumori, 4,620,085, Cl. 219-528.000.

Kuwaki, Keiichi: *See*—
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, 4,619,247, Cl. 128-6.000.

Kyono, Iwao: *See*—
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.

L H Carbide Corporation: *See*—
Neuenschwander, Thomas R., 4,619,028, Cl. 29-33.00L.

La Telemecanique Electrique: *See*—
Lerude, Gerard; and Roux, Christine, 4,620,265, Cl. 361-424.000.

Laakso, John K. Decorative simulated tree lighting apparatus. 4,620,270, Cl. 362-123.000.

La Belle, John T.; Szemeredi, Robert S.; and Tarnay, Matthew G., to Price Pfister, Inc. Unitized control panel. 4,620,075, Cl. 200-159.00B.

Labuc, Vladimir M.: *See*—
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., 4,619,533, Cl. 374-141.000.

Lachenbruch, Roger B.: *See*—
Rathmann, Thomas M.; Drake, Herbert G.; Mirkovich, Ninko T.; and Lachenbruch, Roger B., 4,619,573, Cl. 414-222.000.

Lafferty, James W. Variable rate air spring apparatus for vehicle suspension. 4,619,467, Cl. 280-708.000.

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Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy W. W., 4,620,238, Cl. 360-8.000.

Laidely, Peter. Bushings. 4,619,544, Cl. 403-162.000.

Laing, Karsten. Stator having tooth lamination strips lying between circular cylinders. 4,620,120, Cl. 310-166.000.

L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude: *See*—
Dubrulle, Gerard; and Roullet, Alain, 4,619,113, Cl. 62-64.000.

Laird, Dacon C., III: *See*—
Jones, Elvis E.; Pearce, Terry A.; Laird, Dacon C., III; and Everitt, James H., 4,619,669, Cl. 44-1.00G.

Lam, Bing L.; and Pridgen, Lendon N., to SmithKline Beckman Corporation. Chemical methods and intermediates for preparing substituted pyrimidinones. 4,620,001, Cl. 544-310.000.

Lam, Chiu T.; and Shannon, David M., to Dow Chemical Company, The. Production of phenols and catalyst therefor. 4,620,043, Cl. 568-801.000.

Lambert, Susan L.; Lawson, Randy J.; Johnson, Russell W.; and Barr, Tery L., to UOP Inc. Catalytic composite for conversion of hydrocarbons and the method of preparation. 4,619,906, Cl. 502-66.000.

Lamm, Bo R.: *See*—
Brandstrom, Arne E.; and Lamm, Bo R., 4,620,008, Cl. 546-271.000.

Lancelot, Harry B., III, to Richmond Screw Anchor Co., Inc. Rebar splicing and anchoring. 4,619,096, Cl. 52-726.000.

Landheer, Dolf: *See*—
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, 4,619,515, Cl. 355-3.00R.

Landrau, Felix A.: *See*—
Eckenhoff, James B.; Peery, John R.; and Landrau, Felix A., 4,619,652, Cl. 604-415.000.

Landre, Bernard, to Universal Technic. Electric current measuring tongs with magnetic circuit and pivoting arm. 4,620,151, Cl. 324-127.000.

Landry, Kim. Transcutaneous intravenous illuminator. 4,619,249, Cl. 128-23.000.

Lane, Preston D.: *See*—
Matheson, Charles L.; Lane, Preston D.; Dieringer, James V.; and Ambafz, Emilio, 4,619,677, Cl. 55-510.000.

Lannuzel, Olivier; and Pradal, Thierry, to CGR Ultrasonic. Method for characterizing the structure of a medium and device for carrying out the method. 4,619,267, Cl. 128-660.000.

Laramie, Leon. Closer and sealer, employing channel and parallel aligning member, for gable-topped food cartons. 4,619,398, Cl. 229-17.00G.

Larin, Vyacheslav T.: *See*—
Nikitin, Vladimir A.; Khokhlov, Anatoly M.; Larin, Vyacheslav T.; and Fikhte, Boris A., 4,619,899, Cl. 435-287.000.

Lasiter, David N.: *See*—
Harper, Allan C.; Wilson, Joseph H.; McKee, Randall G.; and Lasiter, David N., 4,619,409, Cl. 241-38.000.

Laska, Eugene M.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,619,934, Cl. 514-277.000.

Lasoen, Jean J., to Massey-Ferguson Services N.V. Vehicle transmission. 4,619,153, Cl. 74-477.000.

Laurent, Henry: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Topert, Michael, 4,619,922, Cl. 514-180.000.

Lavering, Gordon R., to Varian Associates, Inc. Means for liquid cooling a microwave window. 4,620,170, Cl. 333-252.000.

Lawson, Randy J.: *See*—
Lambert, Susan L.; Lawson, Randy J.; Johnson, Russell W.; and Barr, Tery L., 4,619,906, Cl. 502-66.000.

Lay, George E.; Knipstein, Richard A.; and Haigh, Daniel H., to Dow Chemical Company, The. Acne control method. 4,619,826, Cl. 424-78.000.

Lazarus, Conrad: *See*—
Riedl, Reinhold; and Lazarus, Conrad, 4,619,439, Cl. 254-45.000.

Lear Siegler, Inc.: *See*—
Moir, Virginia S., 4,619,594, Cl. 418-5.000.

Lecher, Bernard G., Sr., to Stanley Works, The. Rule clip holder for belt or the like. 4,619,020, Cl. 24-10.00A.

Lectromelt Corporation: *See*—
Persson, John A.; Andrews, Ross E.; and Maola, Michael A., 4,620,308, Cl. 373-105.000.

Lee, Choon Woo: *See*—
Won, In H., 4,619,004, Cl. 2-227.000.

Lee, Do I.: *See*—
Emerson, Richard R.; Lee, Do I.; and Easterly, James P., 4,619,967, Cl. 524-801.000.

Lee, Gil S.; and Subramaniam, A. Ram, to Advanced Micro Devices, Inc. Voltage-temperature compensated threshold for hysteresis line receiver at TTL supply voltage. 4,620,115, Cl. 307-443.000.

Lee, James C. K., to Amdahl Corporation. Integrated circuit packaging systems with double surface heat dissipation. 4,620,215, Cl. 357-81.000.

Lee, Lin-nan; and Redman, Mark D., to Communications Satellite Corp. Video scrambling technique for multiplexed analog component formats. 4,620,224, Cl. 358-119.000.

Lee, Mark L.; and Jaeggi, Christian, to Sandoz Pharm. Corp. Substituted 2-furanyl- or 5-oxo-2-furanyl methoxy phosphoryl alkyl cyclimmonium salts. 4,619,917, Cl. 514-77.000.

Lee, Ping I., to Ciba-Geigy Corporation. Method of producing annealed polyvinyl alcohol contact lens. 4,619,793, Cl. 264-2.600.

Legato Pty. Ltd.: *See*—
Wright, Robert J., 4,619,179, Cl. 84-413.000.

Lehigh University: *See*—
Butt, James A.; Mondal, Kalyan; and Roberts, Preston L., 4,620,283, Cl. 364-493.000.

Lehrer, William I., to Fairchild Camera & Instrument Corp. Method of forming a dielectric layer on a semiconductor device. 4,619,839, Cl. 427-82.000.

Lehrer, William I.: *See*—
Pierce, John M.; and Lehrer, William I., 4,619,844, Cl. 427-248.100.

Leibinger, Berthold; and Herb, Eugen, to Trumpf GmbH & Co. Stop mechanism, particularly for stampling machines. 4,619,448, Cl. 269-303.000.

Lengenfelder, Karl, to M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft. Noise-isolated fastening of an oil sump to a crankcase. 4,619,343, Cl. 181-208.000.

Lenke, Dieter: *See*—
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.

Lentz, Carl M.; Overton, James R.; and Cornell, David D., to Eastman Kodak Company. Preparation of styrene and stilbene compounds. 4,620,055, Cl. 585-438.000.

Lenzer, Xaver; Wistuba, Eberhard; and Modinger, Hermann, to Karl Mengele & Sohne GmbH & Co. KG. Field chopper. 4,619,410, Cl. 241-55.000.

Leonard, Eric M.; Fister, Robert V.; and Pledger, James R., to Eastman Kodak Company. Fabricating optical record media. 4,619,804, Cl. 264-220.000.

Leonhardt, David A.: *See*—
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., 4,619,395, Cl. 228-4.500.

Lerude, Gerard; and Roux, Christine, to La Telemecanique Electrique. Modular cell for supporting and protecting electronic cards. 4,620,265, Cl. 361-424.000.
Lessard, Roy W. Pants rack. 4,619,385, Cl. 223-96.000.
Letzring, Samuel A.: *See*—
Sizer, Theodore, II; Duling, Irl N., III; Petras, Carl H.; and Letzring, Samuel A., 4,620,113, Cl. 307-270.000.
Leuenberger, Rolf; and Hunziker, Christian, to Zellweger Uster, Ltd. Process and device for automatically detecting faults in fabrics and similar textile sheet-like structures. 4,619,527, Cl. 356-238.000.
Leung, Ignatius Y. P.; and Diaz, Adolfo A. Convertible door system. 4,619,074, Cl. 49-143.000.
Leung, Linus K.: *See*—
Schmidt, Gregory E.; Leung, Linus K.; Beck, Lawrence J.; and Chang, David S., 4,620,049, Cl. 585-501.000.
Leung, Roger Y.; and Polak, Anthony J., to Allied Corporation. High strength and high tensile modulus fibers or poly(ethylene oxide). 4,619,988, Cl. 528-421.000.
Leung, Tommy Y.; and Waldron, Mark A., to CTS Corporation. Digital signal processor modem. 4,620,294, Cl. 364-900.000.
Levallois, Emile: *See*—
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,619,762, Cl. 210-170.000.
Levin, Michael M.; and Boshear, Jerry A., to Cybernetic Data Products. Data decoder. 4,620,227, Cl. 358-147.000.
Levy, Uri: *See*—
Gordon, Eugene I.; and Levy, Uri, 4,620,132, Cl. 315-3.000.
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., to United States of America, Energy. Apparatus for oil shale retorting. 4,619,738, Cl. 202-85.000.
Lewis, Geoffrey A.; Timby, Ernest A.; and Walsh, Rodney H., to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Safety fuel degrading. 4,619,581, Cl. 415-143.000.
Lewis, John C., Jr., to Tucel Industries, Inc. Method of manufacturing fused brushes. 4,619,485, Cl. 300-21.000.
Lewis, Thomas E.: *See*—
Sideman, Carl E.; Lewis, Thomas E.; and Nowak, Michael T., 4,619,665, Cl. 8-402.000.
Leymann, Friedhelm, to Heinrich Oelschlager Metallwarenfabrik. Stand for data display terminals. 4,619,427, Cl. 248-178.000.
LiCausi, Joseph M.: *See*—
Kurtz, Leonard D.; and LiCausi, Joseph M., 4,619,647, Cl. 604-318.000.
Lieske, Edgar: *See*—
Rose, David; Lieske, Edgar; and Maak, Norbert, 4,619,666, Cl. 8-414.000.
Lin, Kenneth S.: *See*—
Sasaki, Yukihiko; Lin, Kenneth S.; and Patterson, Dianne L., 4,619,851, Cl. 428-40.000.
Lin, Mark Y.; and Autry, James C., to Autry Industries, Inc. Insole with ribbed arch structure. 4,619,056, Cl. 36-43.000.
Linde Aktiengesellschaft: *See*—
Zimmermann, Heinz, 4,619,757, Cl. 208-57.000.
Linde, Gilbert W., to New Holland Inc. Auger hold down mechanism for manure spreaders. 4,619,405, Cl. 239-675.000.
Lindenau, Bernd: *See*—
Fremery, Johan K.; Lindenau, Bernd; and Witthauer, Klaus, 4,619,144, Cl. 73-708.000.
Lindquist, Per E., to SI Handling Systems, Inc. Driverless tugger vehicle and system. 4,619,204, Cl. 104-166.000.
Lindstrom, Jan N.: *See*—
Smith, Ulf K. H.; and Lindstrom, Jan N., 4,619,866, Cl. 428-336.000.
Lindstrom, Richard L. Intraocular lens. 4,619,656, Cl. 623-6.000.
Linner, John G.; and Goosey, John D., to Board of Regents, The University of Texas System. Apparatus and method for cryopreparing corneal tissue for surgical procedures. 4,619,257, Cl. 128-303.100.
Linnig, Karl-Heinz. Compressor drive for automobile air conditioning compressor having V-belt variable drive. 4,619,587, Cl. 417-319.000.
Linstromberg, William J., to Whirlpool Corporation. Inventory indicating means for refrigeration apparatus. 4,619,221, Cl. 116-307.000.
Lipanski, Scott J., to General Signal Corporation. Combined nozzle with air foil. 4,619,081, Cl. 51-267.000.
Liprad Associates: *See*—
Frame, Gary E., 4,620,107, Cl. 250-566.000.
L'Italien, Yvon J.: *See*—
Butler, Donald E.; and L'Italien, Yvon J., 4,619,937, Cl. 514-323.000.
Liu, Li-Hsiung, to Textron Inc. Automatic compression release for two-cycle engine. 4,619,228, Cl. 123-182.000.
Livingston, Jerry L., to Justrite Manufacturing Company. Safety cabinet latching system. 4,619,076, Cl. 49-367.000.
Lobach, Ernst: *See*—
Tabarelli, Werner; and Lobach, Ernst, 4,619,524, Cl. 355-53.000.
Lobeck, Walter G., Jr.: *See*—
New, James S.; Lobeck, Walter G., Jr.; and Yevich, Joseph P., 4,619,930, Cl. 514-252.000.
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., to Polaroid Corporation, Patent Dept. Image dye-providing materials. 4,619,784, Cl. 540-593.000.
Lockhart, Gaynel J.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.
Loev, Bernard; and Chan, Wan-Kit, to USV Pharmaceutical Corp. Polyene compounds useful in the treatment of allergic responses. 4,619,945, Cl. 514-729.000.
Loewe, Gerhard; Nithammer, Egon; and Zaveri, Vikram, to Keiper Recaro, Inc. Linkage tolerance compensating system. 4,619,031, Cl. 29-434.000.
Lohmann GmbH & Co. KG: *See*—
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, 4,619,253, Cl. 218-156.000.
Long, John B. Belt conveyor cross-stream sampling system. 4,619,149, Cl. 73-863.910.
Long, Louis L.: *See*—
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
L'Oreal: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,620,037, Cl. 568-36.000.
Lorenzelli, Robert; Dabernard, Pierre; and Maire, Christian, to Cogema, Compagnie Generale des Matieres Nucleaires. Transfer device with a double tight barrier between a container and a confinement enclosure. 4,619,572, Cl. 414-217.000.
Loser, Werner: *See*—
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.
Lovering, Dennis W., to GKN Kwikform Limited. Builders scaffolding. 4,619,541, Cl. 403-49.000.
Lowther, Frank E., to Atlantic Richfield Company. Apparatus for storage of compressed gas at ambient temperature. 4,619,225, Cl. 123-3.000.
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., to Noranda Inc. Tuyere pyrometer. 4,619,533, Cl. 374-141.000.
Luck, Edward E.; and Brown, Dennis M., to Matrix Pharmaceuticals, Inc. Treatments employing drug-containing matrices for introduction into cellular lesion areas. 4,619,913, Cl. 514-2.000.
Luhleich, Hartmut: *See*—
Dias, Francisco J.; Kampel, Marian; and Luhleich, Hartmut, 4,619,805, Cl. 264-29.500.
Lupton, Cecel R.: *See*—
Hanker, Jacob S.; Terry, Bill C.; Ambrose, Wallace W.; and Lupton, Cecel R., 4,619,655, Cl. 623-1.000.
Luthra, Krishan L., to General Electric Company. Tungsten laden emission mix of improved stability. 4,620,128, Cl. 313-630.000.
Luthra, Krishan L., to General Electric Company. Gettered high pressure sodium lamp. 4,620,129, Cl. 313-630.000.
Lutsey, Thomas H.; and Bero, Vernon L., to Gold Bond Ice Cream, Inc. Forming and conveying of baked confection shells. 4,619,832, Cl. 426-302.000.
Luz, Zeev: *See*—
Zimmermann, Herbert; Poupko, Raphi; Luz, Zeev; and Billard, Jean, 4,619,788, Cl. 260-410.500.
Lvovsky, Lazar; and Hunt, V. Bruce, to Metapath Inc. Method and apparatus for generating bipolar pulses in a local area network. 4,620,310, Cl. 375-17.000.
Lyster, Thomas D.: *See*—
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,619,265, Cl. 128-419.00D.
M.A.N. Maschinenfabrik Augsburg-Nurnberg Aktiengesellschaft: *See*—
Lengenfelder, Karl, 4,619,343, Cl. 181-208.000.
M.A.N.-Roland Druckmaschinen Aktiengesellschaft: *See*—
Fischer, Hermann, 4,619,449, Cl. 270-5.000.
Maak, Norbert: *See*—
Rose, David; Lieske, Edgar; and Maak, Norbert, 4,619,666, Cl. 8-414.000.
Maas, Henricus G. R.; Slotboom, Jan W.; Appels, Johannes A.; and Osinski, Kazimierz, to U.S. Philips Corporation. Method of manufacturing a semiconductor device and device manufactured by the use of the method. 4,619,039, Cl. 29-591.000.
Machnee, Cecil, to Morris Rod-Weeder Co., Ltd. Flexibility for wide swath agricultural implements. 4,619,330, Cl. 172-311.000.
MacKirdy, William T.: *See*—
Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., 4,619,211, Cl. 112-132.000.
Macsea Marine Services Co., Inc.: *See*—
Wachi, Kiyoshi, 4,619,217, Cl. 114-222.000.
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, to Delphax Systems. Electrostatic printing apparatus and method. 4,619,515, Cl. 355-3.00R.
Maeda, Masahiko; Nakazawa, Toru; Utsunomiya, Yasuharu; and Wataki, Ryuji, to Mita Industrial Co., Ltd. Toner cleaning apparatus in electrophotography. 4,619,523, Cl. 355-15.000.
Maeda, Narimichi: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.
Maeda, Shigeho, to Kabushiki Kaisha Daikin Seisakusho. Clutch cover assembly. 4,619,353, Cl. 192-70.180.

Maeguchi, Ke...: *See*—
Taguchi, Shinji; Matsumura, Homare; and Maeguchi, Kenji, 4,619,037, Cl. 29-578.000.

Maezono, Masakazu; and Ishikawa, Keiichi, to Honda Giken Kogyo Kabushiki Kaisha. Clutch operation control system for fluid torque converter of vehicular transmission. 4,619,350, Cl. 192-3.310.

Maggiulli, Cataldo A.: *See*—
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,002, Cl. 544-318.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,006, Cl. 544-402.000.

Magill, John W.; and Wurster, Carl F. Tissue-retrieving means for a surgical snare instrument. 4,619,260, Cl. 128-309.000.

Magnetic Peripherals Inc.: *See*—
Gitzendanner, Louis G., 4,620,248, Cl. 360-97.000.
Gitzendanner, Louis G., 4,620,251, Cl. 360-103.000.

Magnoni, Pierangelo; Strada, Pier E.; Cavagnis, Walter; and Sanvito, Angelo, to O.F.M.E.C. Officine Meccaniche Mantovane S.p.A. Bed for passive, autopassive or against patient resistance motor re-education, supplied with mechanically controlled and by electronic operated, programmable and controllable components. 4,619,006, Cl. 5-68.000.

Mahajan, Devinder: *See*—
Sapienza, Richard S.; Slegeir, William A.; O'Hare, Thomas E.; and Mahajan, Devinder, 4,619,946, Cl. 518-700.000.

Maier, Josef. Apparatus for erecting arcuate walls of concrete or the like. 4,619,433, Cl. 249-18.000.

Maier, Peter; and Hansel, Gernot. Guide for a hand power tool. 4,619,170, Cl. 83-745.000.

Maire, Christian: *See*—
Lorenzelli, Robert; Dabernard, Pierre; and Maire, Christian, 4,619,572, Cl. 414-217.000.

Makino, Naonori; Horie, Seiji; and Sato, Hideo, to Fuji Photo Film Co., Ltd. Photoconductive composition and electro-photographic light-sensitive material containing a trisazo compound. 4,619,881, Cl. 430-77.000.

Makino, Naonori: *See*—
Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,619,880, Cl. 430-58.000.

Malchesky, Paul S.: *See*—
Nose , Yukihiko; and Malchesky, Paul S., 4,619,639, Cl. 604-6.000.

Malcolm, David H.; and Wilenius, George P. T. Apparatus for dielectrophoretically enhanced particle collection. 4,619,670, Cl. 55-107.000.

Mallon, Richard G.: *See*—
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,619,738, Cl. 202-85.000.

Man Design Co., Ltd.: *See*—
Hasegawa, Tsuneo, 4,619,250, Cl. 128-26.000.

Mankovich, James E.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Mannesmann Aktiengesellschaft: *See*—
Gruner, Hans; Orsech, Helmuth; and Schrewe, Hans, 4,619,306, Cl. 164-150.000.

Mannesmann Tally Corporation: *See*—
Patterson, Richard G., 4,619,538, Cl. 400-621.000.

Manske, Hans E., to Zenith Electronics Corporation. High energy discharge sparkgap. 4,620,126, Cl. 313-325.000.

Manufacturas De Acero Y Caucho S.A.: *See*—
Ripoll Garcia-Mansilla, Javier, 4,619,088, Cl. 52-223.00L.

Manufacture de Machines due Haut-Rhin: *See*—
Boyer, Richard; and Diquet, Joel, 4,619,336, Cl. 177-1.000.

Maola, Michael A.: *See*—
Persson, John A.; Andrews, Ross E.; and Maola, Michael A., 4,620,308, Cl. 373-105.000.

Maram, Jonathan M.: *See*—
Barkhoudarian, Sarkis; August, Rudolf R.; and Maram, Jonathan M., 4,620,093, Cl. 250-231.00P.

Marcoux, Jean A.: *See*—
Dumas, Gerard; and Marcoux, Jean A., 4,619,191, Cl. 99-483.000.

Maren, Thomas H., to University of Florida. Process for reducing intraocular pressure. 4,619,939, Cl. 514-363.000.

Margalit, Shlomo; Chiu, Liew-Chuang; Smith, John S.; and Yariv, Amnon, to California Institute of Technology. Multiple quantum-well infrared detector. 4,620,214, Cl. 357-63.000.

Margolis, Frederick J.; and Cole, Clayton K. Infant respiratory arrest stimulator device. 4,619,270, Cl. 128-721.000.

Margonelli, Andrea: *See*—
Di Stazio, Giovanni; Politi, Vincenzo; Margonelli, Andrea; De Luca, Giovanna; and Materazzi, Mario, 4,619,916, Cl. 514-18.000.

Marhold, Albrecht; and Klauke, Erich, to Bayer Aktiengesellschaft. Benzo-fused, tetrachlorinated heterocyclic compounds and a process for their preparation. 4,620,018, Cl. 549-362.000.

Marion, Frank A., to Universal Propulsion Company, Inc. Propellant material with oxidizer reduction to lead oxide. 4,619,722, Cl. 149-41.000.

Mark, Harold W.: *See*—
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,619,760, Cl. 209-166.000.

Marketing Displays, Inc.: *See*—
Seely, James R.; and McCabe, Jerry A., 4,619,220, Cl. 116-63.00P.

Markowitz, Harry, to Bruedwill, Inc. Double layer fabric material and method for manufacturing same. 4,619,120, Cl. 66-192.000.

Marks, Alvin M. Solar heater with cavity and phase-change material. 4,619,244, Cl. 126-451.000.

Marley Cooling Tower Company, The: *See*—
Carter, William C., 4,619,586, Cl. 416-157.00R.

Marshall, Frank J.: *See*—
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Marso , Miklos: *See*—
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela, 4,619,936, Cl. 514-282.000.

Martin, Glenn L.: *See*—
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Martin, James P.: *See*—
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.

Martin, Robert P., Jr. Lift truck cab. 4,619,479, Cl. 296-190.000.

Martin, Sidney H., to International Computers Limited. Connection arrangement for an electrically screened sleeve. 4,619,488, Cl. 339-14.00R.

Martino, William L., Jr.: *See*—
Remington, Scott; and Martino, William L., Jr., 4,620,299, Cl. 365-230.000.

Marwick, Alan D.; and Sansom, Harry C., deceased (by Sansom, Janet Mary, administratrix), to United Kingdom Atomic Energy Authority. Temperature control. 4,619,030, Cl. 29-404.000.

Maschinenfabrik Walter Scheele GmbH & Co. KG: *See*—
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Maska, Rudolf: *See*—
Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., 4,619,952, Cl. 523-409.000.

Massachusetts Institute of Technology: *See*—
Bozler, Carl O.; Ehrlich, Daniel J.; and Tsao, Jeffrey Y., 4,619,894, Cl. 430-942.000.

Massey-Ferguson Services N.V.: *See*—
Lasoen, Jean J., 4,619,153, Cl. 74-477.000.

Mast, Peter: *See*—
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Materazzi, Mario: *See*—
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Matheson, Charles L.; Lane, Preston D.; Dieringer, James V.; and Ambafz, Emilio, to Cummins Engine Company, Inc. Disposable air filter assembly and method of making same. 4,619,677, Cl. 55-510.000.

Mathews, Richard J., Sr.: *See*—
Sharkany, Edward J.; and Mathews, Richard J., Sr., 4,619,391, Cl. 227-19.000.

Matrix Pharmaceuticals, Inc.: *See*—
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Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, to Mitsui Toatsu Chemicals, Incorporated; and Toyo Engineering Corporation. Continuous production process of styrene-base resin. 4,619,959, Cl. 524-228.000.

Matsui, Isamu; Uchida, Hiroshi; Sekitani, Noboru; and Okumura, Hirokazu, to Murata Kikai Kabushiki Kaisha. Yarn end finding apparatus. 4,619,416, Cl. 242-35.50R.

Matsui, Kazuhiro; and Sugiura, Haruyuki, to Kitagawa Industries Co., Ltd. Appliance for fixing electronic display board. 4,619,431, Cl. 248-500.000.

Matsui, Takeo: *See*—
Teraoka, Fuminori; Matsui, Takeo; and Mori, Shinji, 4,619,417, Cl. 242-107.40A.

Matsumoto, Akio: *See*—
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Matsumoto, Takanao: *See*—
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Matsunawa, Akira: *See*—
Araya, Takeshi; Matsunawa, Akira; Katayama, Seiji; Hioki, Susumu; Ibaraki, Yoshiro; and Endo, Yoshishige, 4,619,691, Cl. 75-0.50B.

Matsuno, Kenichi: *See*—
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Matsuoka, Hikoji, to Matsuoka Machinery Works Co., Ltd. Tablet printing device with orienting brush. 4,619,196, Cl. 101-35.000.
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Baba, Takaaki; and O'Keefe, Gerald T., 4,620,222, Cl. 358-48.000.
Horikawa, Toshihiro; and Kuwabara, Nobumori, 4,620,085, Cl. 219-528.000.
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Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
Matsuzaki, Akio, to Casio Computer Co., Ltd. Input device for an electronic musical instrument. 4,619,175, Cl. 84-1.010.
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Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.
Matty, Thomas C., to Westinghouse Electric Corp. Digital pulse width modulation motor control system. 4,620,143, Cl. 318-811.000.
Matulka, Gerald: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.
Matzinger, Peter, to Sandoz Ltd. Process for the production of azo compounds. 4,619,991, Cl. 534-588.000.
Matzner, Markus; and Papuga, Donald M., to Union Carbide Corporation. Novel poly(aryl ether)- polyester block copolymers. 4,619,975, Cl. 525-437.000.
Maurer, Fritz; and Homeyer, Bernhard, to Bayer Aktiengesellschaft. Triazolyl thionophosphates and insecticidal and nematicidal use thereof. 4,619,918, Cl. 514-93.000.
Maurer, Werner, to Karl M. Reich Maschinenfabrik GmbH. Driving apparatus with nail strip cutter. 4,619,393, Cl. 227-136.000.
Max-Planck-Gesellschaft Zur Foerderung der Wisenschaften E.V.: *See*—
Kotzlowski, Heinz E., 4,619,807, Cl. 376-136.000.
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Zimmermann, Herbert; Poupko, Raphi; Luz, Zeev; and Billard, Jean, 4,619,788, Cl. 260-410.500.
Maxey, John H. Side unloading dump truck. 4,619,484, Cl. 298-18.000.
May, Wayne A.; and Peters, Donald J., to Jensen Corporation. Conveyor assembly. 4,619,358, Cl. 198-457.000.
Mayer, Edward F.: *See*—
Anderson, Carl P.; and Mayer, Edward F., 4,619,450, Cl. 271-35.000.
Mayer, Gunter, to Andreas Stihl. Hedge trimmer. 4,619,045, Cl. 30-216.000.
Mazda Motor Corporation: *See*—
Ueda, Kazuhiko; Hitomi, Mitsuo; and Sasaki, Junzo, 4,619,226, Cl. 123-52.0MB.
Mazza, Louis S. Copy holder for data processing work station. 4,619,429, Cl. 248-447.200.
McArthur, William J.; and Merry, Glenn W., to Duracell Inc. Auxiliary portable power supply. 4,620,111, Cl. 307-150.000.
McBee, Gerald. Door hinge aligning tool. 4,619,132, Cl. 72-458.000.
McCabe, Jerry A.: *See*—
Seely, James R.; and McCabe, Jerry A., 4,619,220, Cl. 116-63.00P.
McCarthy, Clifton J., to Itek Corporation. Wide band tape recorder interface for recording digital image data in real time. 4,620,240, Cl. 360-48.000.
McClanahan, David D.: *See*—
Hannah, Bruce R.; McClanahan, David D.; and Denny, Lee, 4,619,486, Cl. 312-195.000.
McClung, Charles S.: *See*—
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McCormack, John S.: *See*—
Noursharghi, Noorallah; and McCormack, John S., 4,619,680, Cl. 65-3.120.
McCullough, Doyle W. Enhanced circulation drill bit. 4,619,335, Cl. 175-339.000.
McCumber, Roger D.; and Teder, Rein S., to Vericom Corp. Rain-controlled windshield wipers. 4,620,141, Cl. 318-483.000.
McDaniel, Max P.; and Smith, Paul D., to Phillips Petroleum Company. Polymerization catalyst, method of making and use therefor. 4,619,980, Cl. 526-96.000.
McDonald, Edith N.; and Spector, George. Swim safe play suit. 4,619,622, Cl. 441-111.000.
McDonnell Douglas Corporation: *See*—
Vorst, Carl J., 4,620,291, Cl. 364-607.000.
McFarland, Joseph R. Cap for hot beverage cup. 4,619,372, Cl. 220-90.400.
McIntyre, Brian W.; and Biggar, John W., to ISCA Management Limited. Process for removal of pollutants from waste gas emissons. 4,619,608, Cl. 423-220.000.
McKee, Randall G.: *See*—
Harper, Allan C.; Wilson, Joseph H.; McKee, Randall G.; and Lasiter, David N., 4,619,409, Cl. 241-38.000.
McLellan, George R.: *See*—
Blyth, Randolph C.; Ucci, Pompelio A.; and McLellan, George R., 4,619,853, Cl. 428-95.000.
McManus, Ira J. Truss assembly for brick wall or masonry support. 4,619,090, Cl. 52-235.000.
McManus, John R.; and Ubowski, Lawrence W., to Carrier Corporation. Method of making coils. 4,619,024, Cl. 29-157.30R.
McManus, John R.; and Wright, William E., to Carrier Corporation. Method of making coils. 4,619,025, Cl. 29-157.30R.
McNally, Guy W. W.: *See*—
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy W. W., 4,620,238, Cl. 360-8.000.
McNamara, Dennis J.: *See*—
Cook, P. Dan; and McNamara, Dennis J., 4,619,996, Cl. 536-55.300.
McPherson, Hugh; and Blakely, John P., to FERRANTI plc. Chirp signal gating circuit for expander in a pulse compression radar system. 4,620,112, Cl. 307-239.000.
McPherson, Robert R., to Pneumo Corporation. Adjustable transducer and lock mechanism for monitoring valve position. 4,619,288, Cl. 137-554.000.
McQuade, John M.: *See*—
Simpson, Sharon M.; McQuade, John M.; and Boon, John R., 4,619,892, Cl. 430-505.000.
McSpadden, J. Neil: *See*—
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Media Recovery, Inc.: *See*—
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Medical Safetec, Inc.: *See*—
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Medtronic, Inc.: *See*—
Skarstad, Paul M.; and Hayes, Thomas G., 4,619,874, Cl. 429-91.000.
Mefina, S.A.: *See*—
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Meggs, Dennis, to Dennis Meggs Enterprises Limited. Magnetic retention of hockey goals. 4,619,456, Cl. 273-127.00B.
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, to Ciba-Geigy Corporation. Process for the deposition of metals on semiconductor powders. 4,619,838, Cl. 427-53.100.
Meinusch, Norbert: *See*—
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Melamine Chemicals, Inc.: *See*—
Norton, Richard V., 4,619,735, Cl. 162-135.000.
Melcher, Franz-Josef: *See*—
Behrend, Lothar; Ober, Jurgen; Knothe, Erich; and Melcher, Franz-Josef, 4,619,337, Cl. 177-210.00R.
Mellor, Asa B. Rim and tire clamp. 4,619,302, Cl. 152-398.000.
Melroy, Owen R.: *See*—
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Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, to BASF Aktiengesellschaft. Preparation of a magnetic dispersion. 4,619,777, Cl. 252-62.540.
Memory Metals, Inc.: *See*—
Adnyana, Dewa N.; and Rogen, Neil E., 4,619,320, Cl. 166-65.100.
Mentzer, Nancy E.: *See*—
Brown, David S.; Forry, John S.; Mentzer, Nancy E.; and Misselhorn, Donald J., 4,619,860, Cl. 428-213.000.
Merck & Co., Inc.: *See*—
Engelhardt, Edward L.; and Saari, Walfred S., 4,619,927, Cl. 514-218.000.
Sletzinger, Meyer; and Verhoeven, Thomas R., 4,620,025, Cl. 558-401.000.
Merkel, Werner, to Fag Kugelfischer Georg Schafer KGaA. Charging switch for a bar dosimeter for ionizing radiation. 4,620,101, Cl. 250-376.000.
Merry, Glenn W.: *See*—
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Mertens, Heinz, to Maschinenfabrik Walter Scheele GmbH & Co. KG. Support or stabilizer devices for mobile construction equipment. 4,619,369, Cl. 212-189.000.
Mese, Michihiro: *See*—
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Meserol, Peter M.; and Acker, Jesse L., to Personal Diagnostics, Inc. Combined cuvette with integral optical elements and electrical circuit with photoemissive and photosensitive elements in intimate optical contact with said optical elements. 4,619,530, Cl. 356-440.000.
Messerschmitt-Boelkow-Blohm Gesellschaft mit beschraenkter Haftung: *See*—
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Metapath Inc.: *See*—
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Metev, Georgi M.: *See*—
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.
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Metzger, Karl G.: *See*—
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,620,007, Cl. 546-156.000.
Meyer, Alois, to Wagner, Paul-Heinz. Power wrench. 4,619,160, Cl. 81-57.390.
Miale, Joseph N.: *See*—
Chang, Clarence D.; and Miale, Joseph N., 4,620,054, Cl. 585-481.000.
Michael, George W., III: *See*—
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Michaux, Jean-Pierre: *See*—
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc A., 4,619,107, Cl. 57-6.000.
Michels, Hans-Gottfried: *See*—
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Mid-West Conveyor Company, Inc.: *See*—
Summa, Gareth D.; Reed, George K.; and Burt, Harold S., 4,619,575, Cl. 414-280.000.
Midori Anzen Co., Ltd.: *See*—
Watanabe, Moritsuna, 4,619,675, Cl. 55-498.000.
Mikado, Tsuneo, to Nippon Television Industry Corporation. Television signal generator. 4,620,228, Cl. 358-160.000.
Miki, Joh: *See*—
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.
Miki, Yoshiteru: *See*—
Sano, Yoshihiro; Iwatani, Fumio; Kubo, Takao; and Miki, Yoshiteru, 4,620,257, Cl. 361-68.000.
Miles Laboratories, Inc.: *See*—
Wisdom, Leonard A., 4,619,650, Cl. 604-408.000.
Millard, Steven L. Pressure release safety antenna. 4,619,219, Cl. 116-28.00R.
Miller, Carl: *See*—
Havey, Edward J., Jr.; Miller, Carl; and Westerman, Ted, 4,619,101, Cl. 53-117.000.
Miller, David, to Delta International Machinery Corp. Bearing assembly for C-arm scroll saw. 4,619,171, Cl. 83-782.000.
Miller, Norman K. Hollow non-occluding pressure sensor. 4,620,072, Cl. 200-81.00R.
Miller, Steven A., to General Electric Company. Apparatus for melt atomization with a concave melt nozzle for gas deflection. 4,619,597, Cl. 425-7.000.
Miller, William E.: *See*—
Bakken, Kirby L.; Judson, Robert G.; Miller, William E.; and Peterson, Ronald A., 4,620,243, Cl. 360-77.000.
Milyard, Emmert: *See*—
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Sano, Toshio; Takahashi, Masaharu; Murakoshi, Yoichi; and Matsuno, Kenichi, 4,619,127, Cl. 72-56.000.
Minnesota Mining and Manufacturing Company: *See*—
Charbonneau, Robert R.; Heilmann, Steven M.; Rasmussen, Jerald K.; and Tumey, Michael L., 4,619,867, Cl. 428-355.000.
Elmasry, Mohamed A., 4,619,990, Cl. 534-573.000.
Fischer, Edward M., 4,619,553, Cl. 405-63.000.
Kistner, John F., 4,619,949, Cl. 522-170.000.
Klisch, Leo M., 4,619,168, Cl. 83-694.000.
Kotnour, Thomas A.; Barber, Ronald L.; and Krueger, Walter L., 4,619,979, Cl. 526-88.000.
Simpson, Sharon M.; McQuade, John M.; and Boon, John R., 4,619,892, Cl. 430-505.000.
Minnick, Paul D.: *See*—
Bull, Robert W.; Soltysiak, Robert M.; and Minnick, Paul D., 4,619,827, Cl. 424-89.000.
Minten, Karl L.; and Pismennaya, Galina, to Olin Hunt Specialty Products Inc. Process for preparing a non-conductive substrate for electroplating. 4,619,741, Cl. 204-15.000.
Mio, Kotaro; and Ijiri, Yasuo, to Dainichi-Nippon Cables, Ltd. Pile of lead metal sheets for shielding environment from harmful source. 4,619,852, Cl. 428-68.000.
Mirkovich, Ninko T.: *See*—
Rathmann, Thomas M.; Drake, Herbert G.; Mirkovich, Ninko T.; and Lachenbruch, Roger B., 4,619,573, Cl. 414-222.000.
Mishima, Ryoji: *See*—
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Mishiro, Shoji, to Taga Electric Company, Limited. Piezoelectric apparatus for activating square plate resonator. 4,620,121, Cl. 310-323.000.
Misselhorn, Donald J.: *See*—
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Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc A., to Societe Anonyme de Telecommunications; and Societe Industrielle de Liaisons Electriques. Wheel for drawing helical groove ring for optical fibers. 4,619,107, Cl. 57-6.000.
Mita Industrial Co., Ltd.: *See*—
Maeda, Masahiko; Nakazawa, Toru; Utsunomiya, Yasuharu; and Wataki, Ryuji, 4,619,523, Cl. 355-15.000.
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Mitani, Katsuya; Sano, Toshihiro; Nomura, Nobutaka; Numata, Kou; and Utino, Megumi, to Hitachi, Ltd. Terminal control system and method of terminal control. 4,620,273, Cl. 364-136.000.
Mitchell, Alexander G.: *See*—
Mitchell, Norman J.; and Mitchell, Alexander G., 4,619,870, Cl. 428-596.000.
Mitchell, George K., to Rand Steel Technology [Proprietary] Limited. Gas distributing tundish barrier. 4,619,443, Cl. 266-220.000.
Mitchell, Norman J.; and Mitchell, Alexander G. Joining strip for panels. 4,619,870, Cl. 428-596.000.
Mitsubishi Denki Kabushiki Kaisha: *See*—
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Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
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Mitsubishi Jukogyo Kabushiki Kaisha: *See*—
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.
Mitsubishi Kinzoku Kabushiki Kaisha: *See*—
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Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, 4,619,698, Cl. 75-238.000.
Mitsubishi Light Metal Industries Limited: *See*—
Miyamoto, Hitoshi; Momochi, Masanori; and Mishima, Ryoji, 4,619,712, Cl. 148-2.000.
Mitsubishi Paper Mills, Ltd.: *See*—
Miyamoto, Shigehiko; Watanabe, Yoshinobu; and Kishi, Yuriko, 4,620,197, Cl. 346-1.100.
Mitsui Toatsu Chemicals, Incorporated: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, 4,619,689, Cl. 71-119.000.
Mitsuyuki, Hitoshi: *See*—
Shimizu, Isoo; Nomura, Hideki; Uchida, Kazumichi; and Mitsuyuki, Hitoshi, 4,620,056, Cl. 585-452.000.
Mitumaru, Mititosi, to Koyo Seiko Company Limited. Fluid-tight shaft mounting with leakage drainage means. 4,619,458, Cl. 277-24.000.
Miura, Fusayoshi: *See*—
Suzuki, Kenichi; and Miura, Fusayoshi, 4,619,716, Cl. 148-26.000.
Miwa, Noriaki: *See*—
Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, 4,619,698, Cl. 75-238.000.
Miyamaru, Yukio: *See*—
Hatanaka, Kaoru; and Miyamaru, Yukio, 4,620,177, Cl. 340-81.00R.
Miyamoto, Hitoshi; Momochi, Masanori; and Mishima, Ryoji, to Mitsubishi Light Metal Industries Limited. Superplastic aluminum alloy strips and process for producing the same. 4,619,712, Cl. 148-2.000.
Miyamoto, Kazuki, to Canon Kabushiki Kaisha. Image processing apparatus. 4,619,521, Cl. 355-14.00R.
Miyamoto, Masao: *See*—
Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, 4,620,102, Cl. 250-427.000.
Miyamoto, Shigehiko; Watanabe, Yoshinobu; and Kishi, Yuriko, to Mitsubishi Paper Mills, Ltd. Ink jet recording method. 4,620,197, Cl. 346-1.100.
Miyauchi, Yuh: *See*—
Isshiki, Tomiya; Kijima, Yasuhiko; Miyauchi, Yuh; and Kondo, Takao, 4,620,033, Cl. 562-519.000.
Miyazaki, Hideo: *See*—
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.

Miyazaki, Makoto: *See*—
Inoue, Hiroshi; Miyazaki, Makoto; Isoi, Masaaki; and Yoda, Makoto, 4,619,972, Cl. 525-193.000.
Miyazawa, Akira: *See*—
Shiga, Makoto; Miyazawa, Akira; and Miyutani, Mitsuyosi, 4,619,279, Cl. 131-345.000.
Miyoshi, Mituji: *See*—
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
Miyutani, Mitsuyosi: *See*—
Shiga, Makoto; Miyazawa, Akira; and Miyutani, Mitsuyosi, 4,619,279, Cl. 131-345.000.
Miziolek, Andrzej W. Ion neutralization resonance emission elemental detector. 4,620,095, Cl. 250-281.000.
Mizzi, Francois; and Bellon, Jean-Louis, to RDI Limited Partnership. Device for forming signals which are characteristic of the position of a point determined on a surface. 4,620,062, Cl. 178-18.000.
MLS, Inc.: *See*—
Jacobson, Mark E., 4,619,564, Cl. 408-146.000.
Mobil Oil Corporation: *See*—
Chang, Clarence D.; and Hellring, Stuart D., 4,620,044, Cl. 568-833.000.
Chang, Clarence D.; and Miale, Joseph N., 4,620,054, Cl. 585-481.000.
Derouane, Eric G.; and von Ballmoos, Roland, 4,619,818, Cl. 423-306.000.
Heilweil, Israel J.; and Hoskin, Dennis H., 4,619,773, Cl. 252-8.514.
Herrington, F. John, 4,619,638, Cl. 493-439.000.
Valyocsik, Ernest W., 4,619,820, Cl. 423-328.000.
Modinger, Hermann: *See*—
Lenzer, Xaver; Wistuba, Eberhard; and Modinger, Hermann, 4,619,410, Cl. 241-55.000.
Moeller, Mitchell G.: *See*—
Christiansen, Jean E.; Fitzgerald, Maryanne; Moeller, Mitchell G.; Pascalides, Artemis; and Vayda, R. Thaddeus, 4,619,660, Cl. 623-46.000.
Moir, Virginia S., to Lear Siegler, Inc. Stackable rotary vane pump with improved volumetric efficiency. 4,619,594, Cl. 418-5.000.
Molaire, Michel F.; and Kaplan, Mark S., to Eastman Kodak Company. Optical recording element having a polymerized crosslinked homopolymer smoothing layer. 4,619,890, Cl. 430-495.000.
Molded Fiber Glass Company: *See*—
Kappelt, Charles E., Jr., 4,619,368, Cl. 211-41.000.
Molgaard-Nielsen, Arne; and Gunther, Rolf, to William Cook, Europe A/S. Collapsible filter basket. 4,619,246, Cl. 128-1.00R.
Molina, John M., to Molina, Jose F., a part interest. Method and apparatus for treating down hole equipment from corrosion in production well. 4,619,321, Cl. 166-90.000.
Molina, Jose F.: *See*—
Molina, John M., 4,619,321, Cl. 166-90.000.
Moll, Eberhard; Pulker, Hans K.; and Haag, Walter, to Balzers Aktiengesellschaft. Method and apparatus for the reactive vapor deposition of layers of oxides, nitrides, oxynitrides and carbides on a substrate. 4,619,748, Cl. 204-192.310.
Moll, Joseph P. Method and apparatus for keyless offset printing. 4,619,198, Cl. 101-148.000.
Mollerus, Alexander; and Mollerus, Robert. Seal for tunnel washing machines. 4,619,121, Cl. 68-16.000.
Mollerus, Robert: *See*—
Mollerus, Alexander; and Mollerus, Robert, 4,619,121, Cl. 68-16.000.
Molly Maguire, Inc.: *See*—
Goodwin, John D.; and Mulkey, Forrest W., 4,619,911, Cl. 502-411.000.
Molnar, Steven. Apparatus comprising a turbine and associated water extractor and method of translating the potential energy of deep sea water into useful work. 4,619,593, Cl. 417-498.000.
Momochi, Masanori: *See*—
Miyamoto, Hitoshi; Momochi, Masanori; and Mishima, Ryoji, 4,619,712, Cl. 148-2.000.
Monarch Marking Systems, Inc.: *See*—
Hamisch, Paul H., Jr., 4,619,727, Cl. 156-541.000.
Mondal, Kalyan: *See*—
Butt, James A.; Mondal, Kalyan; and Roberts, Preston L., 4,620,283, Cl. 364-493.000.
Mondshine, Thomas C., to Texas United Chemical Corp. Crosslinked fracturing fluids. 4,619,776, Cl. 252-8.551.
Mono Power Co.: *See*—
Gritters, Gregory A.; and Perez, Jose M., 4,619,769, Cl. 210-747.000.
Monsanto Company: *See*—
Blyth, Randolph C.; Ucci, Pompelio A.; and McLellan, George R., 4,619,853, Cl. 428-95.000.
Yu, Jing-peir, 4,619,803, Cl. 264-176.200.
Moon, Philip A. K., to Plessey Overseas Limited. Signal strength detector. 4,620,114, Cl. 307-350.000.
Moore, Bernard S.: *See*—
Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,620,019, Cl. 549-404.000.
Moore, Harry W., III, to Facet Enterprises, Incorporated. Wet motor gerotor fuel pump with vapor vent valve and improved flow through the armature. 4,619,588, Cl. 417-366.000.
Moore, M. Samuel. Helicopter engine warning or control system. 4,619,110, Cl. 60-39.091.
Morcom, Paul J.: *See*—
Kirkland, Donald R.; and Morcom, Paul J., 4,619,066, Cl. 43-25.000.
Moretti, Anthony L.; and Pellolio, Anselmo P., Jr., to E. D. Bullard Company. Protective respirator hood with inner and outer bibs. 4,619,254, Cl. 128-201.230.
Morgan, Bridget M.: *See*—
Shattock, Alan G.; and Morgan, Bridget M., 4,619,896, Cl. 435-7.000.
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., to Physio-Control Corporation. Interactive portable defibrillator including ECG detection circuit. 4,619,265, Cl. 128-419.00D.
Mori, Kohei; and Suzuki, Haruo, to Jidosha Kiki Co., Ltd. Brake booster. 4,619,185, Cl. 91-369.00R.
Mori, Nobuyuki: *See*—
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.
Mori, Shinji: *See*—
Teraoka, Fuminori; Matsui, Takeo; and Mori, Shinji, 4,619,417, Cl. 242-107.40A.
Mori, Yasuki: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.
Morishita, Hirosada: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.
Morita, Haruyuki: *See*—
Nakayama, Masatoshi; Morita, Haruyuki; and Kubota, Yuichi, 4,619,861, Cl. 428-220.000.
Morita, Kiyoshi: *See*—
Okamoto, Yoshiyuki; Sato, Kazuhiko; Uryu, Shunji; and Morita, Kiyoshi, 4,619,080, Cl. 51-251.000.
Morita, Kouichi: *See*—
Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, 4,619,687, Cl. 71-92.000.
Moriya, Koichi: *See*—
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,619,688, Cl. 71-92.000.
Morrell, Albert M.; Hughes, Richard H.; and Barkow, William H., to RCA Corporation. Color image display systems. 4,620,133, Cl. 315-15.000.
Morris, John C.; and Jackson, Winston J., Jr., to Eastman Kodak Company. Blends of copolyesters and polycarbonate. 4,619,976, Cl. 525-439.000.
Morris, Robert L., to Ford Motor Company. Interactive idle speed control with a direct fuel control. 4,619,232, Cl. 123-339.000.
Morris Rod-Weeder Co., Ltd.: *See*—
Machnee, Cecil, 4,619,330, Cl. 172-311.000.
Morrison, David W., to Advanced Cardiovascular Systems, Inc. Torsional guide wire with attenuated diameter. 4,619,274, Cl. 128-772.000.
Morton Thiokol, Inc.: *See*—
Bell, Frank H., 4,619,200, Cl. 102-275.000.
Moss, Parry A.; and Rotoloni, Francis A., to AT&T Technologies, Inc. Methods of and apparatus for marking elongated strand material. 4,619,842, Cl. 427-163.000.
Mossaad, Amgad S.: *See*—
Sutker, Burton J.; Hussain, Saadat; and Mossaad, Amgad S., 4,619,961, Cl. 524-393.000.
Motorola, Inc.: *See*—
Pintchovski, Faivel S., 4,619,038, Cl. 29-590.000.
Remington, Scott; and Martino, William L., Jr., 4,620,299, Cl. 365-230.000.
Ross, Danny E.; and Bond, Larry O., 4,619,275, Cl. 128-783.000.
Motoyama, Kichizo; and Araki, Yoshiharu, to Kabushiki Kaisha Johnan Seisakusho; and Aichi Machine Industry Co., Ltd. Sunroof panel opening/closing apparatus. 4,619,480, Cl. 296-217.000.
Motschan, Georges. Utilization of a single vitamin or a combination of various vitamins. 4,619,829, Cl. 424-128.000.
Mount Sinai School of Medicine of The City University of New York: *See*—
Schanzer, Harry, 4,619,641, Cl. 604-8.000.
Moyer, James D., to Raychem Corporation. Braider carrier. 4,619,180, Cl. 87-57.000.
Mrenna, Stephen A.; and Vosler, Gale C., to Westinghouse Electric Corp. Circuit breaker apparatus with line terminal shields. 4,620,076, Cl. 200-304.000.
MTU Motoren-und Turbinen-Union Muenchen GmbH: *See*—
Hirschmeier, Manfred; and Kreitl, Josef, 4,619,707, Cl. 134-3.000.
Mueller, Karl F., to Ciba-Geigy Corporation. Perfluoroalkyl substituted polymers. 4,619,974, Cl. 525-332.400.
Mukushi, Toshimi: *See*—
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.
Mulkey, Forrest W.: *See*—
Goodwin, John D.; and Mulkey, Forrest W., 4,619,911, Cl. 502-411.000.
Muller, Gunter; and Damm, Norbert, to BMD Badische Maschinenfabrik Durlach GmbH. Apparatus for compressing foundry moulding material by pressure gas. 4,619,307, Cl. 164-169.000.

Muller, Hanns P.: *See—*
Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, 4,619,966, Cl. 524-589.000.
Muller, Klaus; and Oberacker, Sieghard, to Alldos Eichler KG. Diaphragm pump, particularly for dosing liquids. 4,619,589, Cl. 417-388.000.
Muller Manufacturing Ltd: *See—*
Geisinger, Wolfgang, 4,619,102, Cl. 53-399.000.
Muller, Rolf, to Papst-Motoren GmbH & Co. KG. Drive arrangement with collectorless D.C. motor. 4,620,138, Cl. 318-254.000.
Multiform Desiccants, Inc.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,619,673, Cl. 55-387.000.
Muraishi, Masakazu; and Hira, Kazumi, to Nissan Motor Co., Ltd. Method of producing a headrest. 4,619,725, Cl. 156-182.000.
Murakoshi, Yoichi: *See—*
Sano, Toshio; Takahashi, Masaharu; Murakoshi, Yoichi; and Matsuno, Kenichi, 4,619,127, Cl. 72-56.000.
Murata Erie N.A., Inc.: *See—*
Blickstein, Martin J., 4,620,169, Cl. 333-235.000.
Murata Kikai Kabushiki Kaisha: *See—*
Matsui, Isamu; Uchida, Hiroshi; Sekitani, Noboru; and Okumura, Hirokazu, 4,619,416, Cl. 242-35.50R.
Murphy, Wesley W., III: *See—*
Naimpally, Saiprasad V.; and Murphy, Wesley W., III, 4,620,220, Cl. 358-40.000.
Murray, Lawrence K., to Phillips Petroleum Company. Carbon black production apparatus. 4,619,812, Cl. 422-156.000.
Muse, Lauchlin M., Jr. Combination surfboard-kneeboard. 4,619,619, Cl. 441-65.000.
Musil, Gerhard, to Siemens Aktiengesellschaft. Circuit arrangement for feeding electrical users via a switch controller. 4,620,271, Cl. 363-21.000.
Mutsers, Stanislaus M. P., to Unie van Kunstmestfabrieken B.V. Process for the preparation of granules. 4,619,843, Cl. 427-213.000.
Myers, John W.; Parrott, Stephen L.; and Sughrue, Edward L., to Phillips Petroleum Company. Two-stage hydrotreating of a mixture of resid and light cycle oil. 4,619,759, Cl. 208-210.000.
Myers, Roderick J.: *See—*
Salama, Mamdouh M.; Myers, Roderick J.; Thomason, William H.; and Joosten, Michael H., 4,619,557, Cl. 405-211.000.
Nagai, Kunio: *See—*
Amano, Toshio; Fujioka, Yoshihisa; Nagai, Kunio; and Oda, Osamu, 4,620,229, Cl. 358-194.100.
Nagano, Eiki: *See—*
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Nagano, Fumikazu: *See—*
Tanaka, Seiichi; and Nagano, Fumikazu, 4,620,236, Cl. 358-293.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Rear derailleur for a bicycle. 4,619,632, Cl. 474-80.000.
Nagano, Masashi, to Shimano Industrial Company Limited. Derailleur for a bicycle. 4,619,633, Cl. 474-82.000.
Nagata, Toru: *See—*
Aoshima, Chikara; and Nagata, Toru, 4,619,509, Cl. 354-173.100.
Nagayama, Kosei: *See—*
Ushifusa, Nobuyuki; Ogihara, Satoru; and Nagayama, Kosei, 4,620,264, Cl. 361-414.000.
Nagel, Harry C., to American Standard Inc. Pulse code system for railroad track circuits. 4,619,425, Cl. 246-34.00R.
Nagy, Neil F.: *See—*
Kessler, Bayard F.; and Nagy, Neil F., 4,620,064, Cl. 179-2.00C.
Naimpally, Saiprasad V.; and Murphy, Wesley W., III, to RCA Corporation. Wideband chrominance signal filter. 4,620,220, Cl. 358-40.000.
Naito, Kazufumi, to Kabushiki Kaisha Ishida Koki Seisakusho. Double integrating-type analog-to-digital converter. 4,620,178, Cl. 340-347.0NT.
Naito, Takayuki: *See—*
Hoshi, Hideaki; and Naito, Takayuki, 4,619,925, Cl. 514-200.000.
Naka, Hiromitsu, to Kabushiki Kaisha Naka Gijutsu Kenkyusho. Ceiling construction. 4,619,086, Cl. 52-205.000.
Nakagaki, Shintaro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, 4,620,221, Cl. 358-47.000.
Nakagawa, Kazuyuki: *See—*
Banno, Kazuo; Fujioka, Takafumi; Osaki, Masaaki; and Nakagawa, Kazuyuki, 4,619,932, Cl. 514-253.000.
Nakagawa, Tadashi: *See—*
Ohta, Kimihiro; Nakagawa, Tadashi; Kawai, Naoyuki; Kojima, Takeshi; and Kawashima, Mitsuo, 4,620,206, Cl. 357-4.000.
Nakagome, Keisuke: *See—*
Kamiyama, Yoshiyasu; Yoshioka, Noriaki; and Nakagome, Keisuke, 4,619,767, Cl. 210-490.000.
Nakajima, Nobuyoshi: *See—*
Tanaka, Hiroshi; Adachi, Yuuma; and Nakajima, Nobuyoshi, 4,620,097, Cl. 250-327.200.
Nakajima, Tadakatsu: *See—*
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, 4,619,316, Cl. 165-104.330.
Nakamura, Kazuharu; and Nakanishi, Yutaka, to Toyotomi Kogyo Co., Ltd. Combustion cylinder construction for oil burner. 4,619,603, Cl. 431-201.000.
Nakamura, Koichi: *See—*
Aono, Toshiaki; Nakamura, Koichi; and Nakamura, Taku, 4,619,883, Cl. 430-203.000.
Nakamura, Taku: *See—*
Aono, Toshiaki; Nakamura, Koichi; and Nakamura, Taku, 4,619,883, Cl. 430-203.000.
Nakanishi Dental Mfg. Co., Ltd.: *See—*
Baba, Tadashi; and Kaneko, Norimasa, 4,619,614, Cl. 433-99.000.
Nakanishi, Kazuhiro, to Konishiroku Photo Industry Co., Ltd. Camera. 4,619,510, Cl. 354-173.100.
Nakanishi, Koichi: *See—*
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.
Nakanishi, Yutaka: *See—*
Nakamura, Kazuharu; and Nakanishi, Yutaka, 4,619,603, Cl. 431-201.000.
Nakano, Yoshiyuki: *See—*
Goto, Tetsuro; and Nakano, Yoshiyuki, 4,619,511, Cl. 354-217.000.
Nakaoka, Sadaaki: *See—*
Takahashi, Michihiko; Saito, Eiichi; Okano, Takeshi; and Nakaoka, Sadaaki, 4,619,519, Cl. 355-11.000.
Nakatani, Kaname; and Kato, Yoshiaki, to Mita Industrial Co., Ltd. Electrostatic image forming apparatus using field effect transistors. 4,620,203, Cl. 346-153.100.
Nakawaki, Yasunori, to Toyota Jidosha Kabushiki Kaisha. Torque transmitting belt. 4,619,634, Cl. 474-201.000.
Nakayama, Masatoshi; Morita, Haruyuki; and Kubota, Yuichi, to TDK Corporation. Magnetic powders with improved dispersibility. 4,619,861, Cl. 428-220.000.
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, to Hitachi, Ltd. Heat transfer apparatus. 4,619,316, Cl. 165-104.330.
Nakayama, Yasuhiko: *See—*
Sakai, Ikuo; Karimoto, Hiroyasu; and Nakayama, Yasuhiko, 4,619,720, Cl. 148-403.000.
Nakazawa, Toru: *See—*
Maeda, Masahiko; Nakazawa, Toru; Utsunomiya, Yasuharu; and Wataki, Ryuji, 4,619,523, Cl. 355-15.000.
Nakazono, Akiko: *See—*
Hashimoto, Tadanori; Yoshitake, Hiroshi; Hata, Shigenao; and Nakazono, Akiko, 4,619,704, Cl. 106-286.400.
Napier, Edward D. Beverage filter unit and support. 4,619,830, Cl. 426-82.000.
Naruo, Kyoichi: *See—*
Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, 4,619,868, Cl. 428-425.100.
Natansohn, Samuel; and Czupryna, Gary, to GTE Laboratories Incorporated. Process for the synthesis of silicon nitride. 4,619,905, Cl. 501-97.000.
National Foundation for Cancer Research: *See—*
Szent-Gyorgyi, Albert; and Fodor, Gabor B., 4,620,014, Cl. 548-545.000.
National Foundation for Cancer Research, Inc.: *See—*
Giaever, Ivar; and Keese, Charles R., 4,619,904, Cl. 436-518.000.
Nauckhoff, Sven H. H.: *See—*
Daniell, Thomas P.; Harding, Robert C., Jr.; Harvey, Roger W. R.; and Nauckhoff, Sven H. H., 4,620,276, Cl. 364-200.000.
Naydenov, Ivan H.: *See—*
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.
NB Jackets de Puerto Rico: *See—*
Dorman, Isidore, 4,619,367, Cl. 209-608.000.
NCR Corporation: *See—*
Janning, John L., 4,619,034, Cl. 29-571.000.
NEC: *See—*
Ozawa, Takashi, 4,620,298, Cl. 365-189.000.
NEC Corporation: *See—*
Ogasawara, Kazuo, 4,620,212, Cl. 357-51.000.
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Yoshida, Yasuharu; and Yagi, Manabu, 4,620,159, Cl. 329-50.000.
Nedstedt, Ulf, to Tetra Pak International AB. Sensing arrangement on a material roll. 4,620,184, Cl. 340-675.000.
Negishi, Ichiro: *See—*
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, 4,620,221, Cl. 358-47.000.
Nelson, Donald F. Balanced steerable transmission. 4,619,158, Cl. 74-695.000.
Neogen Corporation: *See—*
Bull, Robert W.; Soltysiak, Robert M.; and Minnick, Paul D., 4,619,827, Cl. 424-89.000.
Nepomuceno, Jose G.: *See—*
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
Netzov, Nikola M.: *See—*
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.

Neuenschwander, Thomas R., to L H Carbide Corporation. Apparatus for manufacture of laminated parts. 4,619,028, Cl. 29-33.00L.
New Holland Inc.: *See—*
Linde, Gilbert W., 4,619,405, Cl. 239-675.000.
New, James S.; Lobeck, Walter G., Jr.; and Yevich, Joseph P., to Bristol-Myers Company. Antipsychotic cyclic imide derivatives of 2-(4-butylpiperazin-1-yl)pyridines, compositions and use. 4,619,930, Cl. 514-252.000.
Newell, A. Scott, Jr.: *See—*
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Hama, Tomio; and Yamazaki, Kiyoyasu, 4,619,287, Cl. 137-513.300.
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Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, 4,619,688, Cl. 71-92.000.
Niiya, Kazunori: *See—*
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Goor, Dan; Niles, Everett; and Stone, Robert L., 4,619,872, Cl. 428-632.000.
Nippon Cable System, Inc.: *See—*
Suzuki, Kazuhiro, 4,619,152, Cl. 74-473.00R.
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Hotta, Tadahiko; and Sakakibara, Shingo, 4,619,035, Cl. 29-576.00C.
Isii, Sigeki, 4,619,176, Cl. 84-1.030.
Kondoh, Motoya, 4,619,178, Cl. 84-410.000.
Okumura, Takatoshi, 4,619,174, Cl. 84-1.010.
Nippon Joucomatic Co., Ltd.: *See—*
Kimura, Takashi, 4,619,188, Cl. 92-26.000.
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Ishikura, Tsukasa, 4,620,003, Cl. 544-354.000.
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Goto, Tetsuro; and Nakano, Yoshiyuki, 4,619,511, Cl. 354-217.000.
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Hattori, Michinori; and Niiya, Kazunori, 4,619,442, Cl. 266-193.000.
Kawawa, Takaho, 4,619,308, Cl. 164-416.000.
Nippon Oil Company, Limited: *See—*
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
Nippon Paint Co., Ltd.: *See—*
Ishii, Keizou; Kurauchi, Takeo; Nozue, Jun; and Ishikura, Shinichi, 4,619,965, Cl. 524-547.000.
Nippon Petrochemicals Co., Ltd.: *See—*
Shimizu, Isoo; Nomura, Hideki; Uchida, Kazumichi; and Mitsuyuki, Hitoshi, 4,620,056, Cl. 585-452.000.
Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Ono, Tetsuji; Ichihara, Shoichi; Ohta, Tomohisa; and Terui, Sadao, 4,619,909, Cl. 502-303.000.
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Arata, Yoshiaki; and Kobayashi, Akira, 4,620,080, Cl. 219-121.0PP.
Iuchi, Tohru; and Tanaka, Fumio, 4,619,529, Cl. 356-358.000.
Kozono, Haruo; and Arakawa, Isao, 4,619,472, Cl. 285-334.000.
Okamoto, Yoshiyuki; Sato, Kazuhiko; Uryu, Shunji; and Morita, Kiyoshi, 4,619,080, Cl. 51-251.000.
Nippon Telegraph & Telephone Public Corporation: *See—*
Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, 4,619,695, Cl. 75-65.0EB.
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Mikado, Tsuneo, 4,620,228, Cl. 358-160.000.
Nippon Tensaiseito Kabushiki Kaisha: *See—*
Yamada, Yasutsugu, 4,619,700, Cl. 106-15.050.
Nippondenso Co., LTD.: *See—*
Tsuru, Naohiko; and Nomura, Yoshihisa, 4,619,289, Cl. 137-627.500.
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Nishikawa, Masumi: *See—*
Kazaoka, Kenichi; Ishikawa, Masanobu; and Nishikawa, Masumi, 4,619,548, Cl. 403-290.000.
Nishimura, Atsushi: *See—*
Haruna, Tohru; and Nishimura, Atsushi, 4,619,958, Cl. 524-102.000.
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Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.
Nishimura, Ysunobu: *See—*
Kawai, Toshikazu; Nishimura, Ysunobu; and Kanesaki, Katumi, 4,620,042, Cl. 568-775.000.
Nishizawa, Jun-ichi. Method of manufacturing a Group II–VI semiconductor device having a PN junction. 4,619,718, Cl. 148-171.000.
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Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, 4,619,685, Cl. 71-78.000.
Nissan Motor Co., Ltd.: *See—*
Muraishi, Masakazu; and Hira, Kazumi, 4,619,725, Cl. 156-182.000.
Nisshin-DCA Foods Inc.: *See—*
Abe, Kazuo; and Shimamura, Akira, 4,619,598, Cl. 425-131.100.
Nithammer, Egon: *See—*
Loewe, Gerhard; Nithammer, Egon; and Zaveri, Vikram, 4,619,031, Cl. 29-434.000.
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Kamiyama, Yoshiyasu; Yoshioka, Noriaki; and Nakagome, Keisuke, 4,619,767, Cl. 210-490.000.
Nobles, David A.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.
Noguchi, Masahiko: *See—*
Futaba, Takeshi; and Noguchi, Masahiko, 4,619,339, Cl. 180-143.000.
Noguti, Hisao: *See—*
Kawanobe, Yasutaka; Noguti, Hisao; Kanou, Singi; and Yamazaki, Katsuya, 4,619,694, Cl. 75-59.140.
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Jansen, Winfried; and Nolde, Wolfgang, 4,620,314, Cl. 381-4.000.
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Tsuru, Naohiko; and Nomura, Yoshihisa, 4,619,289, Cl. 137-627.500.
Noorily, Peter; and Slachetka, Joseph P., to Thomas & Betts Corporation. Shielded electrical connector. 4,619,494, Cl. 339-103.00M.
Noranda Inc.: *See—*
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., 4,619,533, Cl. 374-141.000.
Nordal, Per-Erik; and Kanstad, Svein O. Infrared radiation source arrangement. 4,620,104, Cl. 250-493.100.
Norman, Robert W., Jr.: *See—*
Boothroyd, Donald C.; and Norman, Robert W., Jr., 4,620,274, Cl. 364-200.000.
Norris, Colin, to Titan Manufacturing Co. Pty. Ltd., The. Rock bolting. 4,619,559, Cl. 405-259.000.
North American Agricultural, Inc.: *See—*
Carroll, Michael W.; and Harwood, Michael E., 4,619,085, Cl. 52-192.000.
North American Philips Corporation: *See—*
Karr, Dennis K.; and Sprankle, David A., 4,620,175, Cl. 337-343.000.
Northern Telecom Limited: *See—*
Carlton, Stephen C., 4,620,180, Cl. 340-347.0DD.
Norton, Richard V., to Melamine Chemicals, Inc. Method of retarding paper degradation with time by treatment with melamine, and method of producing ageing-resistant paper coated with melamine. 4,619,735, Cl. 162-135.000.

Norwich Eaton Pharmaceuticals, Inc.: *See*—
Burch, Homer A.; and Ebetino, Frank F., 4,619,928, Cl. 514-236.000.

Nose , Yukihiko; and Malchesky, Paul S., to Asahi Medical Co., Ltd. Method and apparatus for low pressure filtration of plasma from blood. 4,619,639, Cl. 604-6.000.

Nourshargh, Noorallah; and McCormack, John S., to General Electric Co. p.l.c., The. Manufacture of integrated optical waveguides. 4,619,680, Cl. 65-3.120.

Nova Chem Limited: *See*—
Hayes, Ernest R., 4,619,995, Cl. 536-20.000.

Novak, Christopher: *See*—
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, 4,619,515, Cl. 355-3.00R.

Novation, Inc.: *See*—
Kessler, Bayard F.; and Nagy, Neil F., 4,620,064, Cl. 179-2.00C.

Nowack, Gerhard P.: *See*—
Johnson, Marvin M.; and Nowack, Gerhard P., 4,619,907, Cl. 502-210.000.

Nowak, Michael T.: *See*—
Sideman, Carl E.; Lewis, Thomas E.: and Nowak, Michael T., 4,619,665, Cl. 8-402.000.

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Ishii, Keizou; Kurauchi, Takeo; Nozue, Jun; and Ishikura, Shinichi, 4,619,965, Cl. 524-547.000.

NPSP po Hydroplastichna Obrabotka na Metalite: *See*—
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.

NSK-Warner K. K.: *See*—
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, 4,619,352, Cl. 192-41.00A.

Nukem GmbH: *See*—
Quittkat, Jorg; Thiel, Gerhard; and Ursula, Ruth, 4,620,162, Cl. 331-45.000.

Numaho, Yoshio; Kato, Yoshio; Okada, Hiroshi; and Ogawa, Tetsuro, to Tokyo Keiki Company, Ltd. Sweep termination signal generating apparatus for radar system. 4,620,137, Cl. 315-378.000.

Numata, Kou: *See*—
Mitani, Katsuya; Sano, Toshihiro; Nomura, Nobutaka; Numata, Kou; and Utino, Megumi, 4,620,273, Cl. 364-136.000.

Numberger, Christian K. Vertical maltdrying kiln. 4,619,606, Cl. 432-99.000.

Nunn, Jack D. Apparatus and method for calibrating environment control systems. 4,619,135, Cl. 73-4.00R.

Nusbaum, Ronald C. System for extracting silver from liquid solutions. 4,619,749, Cl. 204-228.000.

Nynex Corporation: *See*—
Shirian, Said, 4,619,291, Cl. 138-109.000.

O. Dorries GmbH: *See*—
Peiffer, Joseph, 4,619,571, Cl. 414-130.000.

O.E.T. - Metalconsult S.r.l.: *See*—
Gorgerino, Mario D., 4,619,696, Cl. 75-130.00R.

O.F.M.E.C. Officine Meccaniche Mantovane S.p.A.: *See*—
Magnoni, Pierangelo; Strada, Pier E.; Cavagnis, Walter; and Sanvito, Angelo, 4,619,006, Cl. 5-68.000.

O.I. Corporation: *See*—
Bernard, Bernie B., 4,619,902, Cl. 436-145.000.

Obara, Clifford J.: *See*—
Holmes, Bruce J.; Martin, Glenn L.; Domack, Christopher S.; Obara, Clifford J.; and Hassan, Ahmed A., 4,619,423, Cl. 244-130.000.

Ober, Jurgen: *See*—
Behrend, Lothar; Ober, Jurgen; Knothe, Erich; and Melcher, Franz-Josef, 4,619,337, Cl. 177-210.00R.

Oberacker, Sieghard: *See*—
Muller, Klaus; and Oberacker, Sieghard, 4,619,589, Cl. 417-388.000.

Oborzil, Edit; and Jeney, Tibor. Bell. 4,619,846, Cl. 428-11.000.

O'Brien, Edward J. Ozone H_2O treatment. 4,619,763, Cl. 210-177.000.

O'Brien, Robert B., to O'Brien, Robert K. Latching magnetic actuator. 4,620,173, Cl. 335-205.000.

O'Brien, Robert K.: *See*—
O'Brien, Robert B., 4,620,173, Cl. 335-205.000.

Occidental Chemical Corporation: *See*—
Alsop, Derek J., 4,620,040, Cl. 568-656.000.

Oda, Osamu: *See*—
Amano, Toshio; Fujioka, Yoshihisa; Nagai, Kunio; and Oda, Osamu, 4,620,229, Cl. 358-194.100.

O'Donnell, William P.: *See*—
Skinner, Harry W.; Skinner, James W.; Skinner, William O.; and O'Donnell, William P., 4,619,555, Cl. 405-154.000.

Odry, Stefan: *See*—
Janthur, Ingo W.; Roth, Alfred; and Odry, Stefan, 4,619,073, Cl. 49-74.000.

Ogasawara, Kazuo, to NEC Corporation. Semiconductor device with a resistor of polycrystalline silicon. 4,620,212, Cl. 357-51.000.

Ogawa, Hiroshi, to Sony Corporation. Digital signal detecting and compensating circuit with adjustable window signal. 4,620,300, Cl. 369-33.000.

Ogawa, Mutsuo; Hashimoto, Takemi; Hara, Kazuyuki; and Kondo, Mitsuru, to Ricoh Company, Ltd. Facsimile transceiver utilizing orthogonal conversion. 4,620,233, Cl. 358-260.000.

Ogawa, Tetsuro: *See*—
Numaho, Yoshio; Kato, Yoshio; Okada, Hiroshi; and Ogawa, Tetsuro, 4,620,137, Cl. 315-378.000.

Ogihara, Satoru: *See*—
Ushifusa, Nobuyuki; Ogihara, Satoru; and Nagayama, Kosei, 4,620,264, Cl. 361-414.000.

Ohannesian, Michael J. Tool for installing and aligning camshaft bushings in internal combustion engines. 4,619,027, Cl. 29-275.000.

O'Hare, Thomas E.: *See*—
Sapienza, Richard S.; Slegeir, William A.; O'Hare, Thomas E.; and Mahajan, Devinder, 4,619,946, Cl. 518-700.000.

Ohkubo, Yasunori: *See*—
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,619,730, Cl. 156-617.0SP.

Ohlinger, Manfred: *See*—
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.

Ohmomo, Yoshiro: *See*—
Yokoyama, Akira; and Ohmomo, Yoshiro, 4,619,823, Cl. 424-1.100.

Ohnhaus, Buford. Airflow measurement shroud. 4,619,138, Cl. 73-198.000.

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Ohta, Tomohisa: *See*—
Ono, Tetsuji; Ichihara, Shoichi; Ohta, Tomohisa; and Terui, Sadao, 4,619,909, Cl. 502-303.000.

Ohtsuka, Kohki: *See*—
Suenaga, Makoto; Yano, Mitsuru; Ishihara, Yasuoki; and Ohtsuka, Kohki, 4,619,713, Cl. 148-3.000.

Ohtsuka, Shuichi: *See*—
Yamana, Keiichi; Tachibana, Hajime; and Ohtsuka, Shuichi, 4,619,513, Cl. 355-3.0CH.

Ohtsuki, Takashi: *See*—
Taniguchi, Shin ichi; and Ohtsuki, Takashi, 4,619,360, Cl. 198-471.100.

Oikawa, Hideo; Amazawa, Takao; Honma, Nakahachiro; Miyazaki, Hideo; Kyono, Iwao; Mori, Nobuyuki; Katoh, Yoshiharu; and Kuroki, Masami, to Nihon Kogyo Kabushiki Kaisha; and Nippon Telegraph & Telephone Public Corporation. Process for producing high-purity metal targets for LSI electrodes. 4,619,695, Cl. 75-65.0EB.

Oil Dynamics, Inc.: *See*—
Farque, Claude A., 4,620,189, Cl. 340-856.000.

Oji Paper Company, Ltd.: *See*—
Awata, Yasuhira; and Iwaki, Osamu, 4,619,796, Cl. 264-29.400.

Oka, Hiroyuki: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.

Okada, Hiroshi: *See*—
Numaho, Yoshio; Kato, Yoshio; Okada, Hiroshi; and Ogawa, Tetsuro, 4,620,137, Cl. 315-378.000.

Okada, Junichi: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,620,202, Cl. 346-140.00R.

Okada, Tooru; Yokoyama, Takanao; Ueda, Atsushi; and Iwata, Toshio, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha; and Mitsubishi Denki Kabushiki Kaisha. Control apparatus of internal combustion engine. 4,619,236, Cl. 123-425.000.

Okamoto, Kenji, to Diesel Kiki Co., Ltd. Electronically controlled fuel injection apparatus. 4,619,234, Cl. 123-357.000.

Okamoto, Yoshio; and Hatada, Koichi, to Daicel Chemical Industries, Ltd. Separation agent. 4,619,970, Cl. 525-100.000.

Okamoto, Yoshiyuki; Sato, Kazuhiko; Uryu, Shunji; and Morita, Kiyoshi, to Nippon Steel Corporation. Roll grinding apparatus for rolling mills. 4,619,080, Cl. 51-251.000.

Okano, Takeshi: *See*—
Takahashi, Michihiko; Saito, Eiichi; Okano, Takeshi; and Nakaoka, Sadaaki, 4,619,519, Cl. 355-11.000.

Okashiro, Tetsuo: *See*—
Iwai, Shingo; Suzuki, Ryozo; Shiraga, Jun; and Okashiro, Tetsuo, 4,619,591, Cl. 417-422.000.

Okaya, Takuji: *See*—
Anzawa, Haruyoshi; Satoh, Kenji; Tanaka, Yoshinari; and Okaya, Takuji, 4,619,849, Cl. 428-35.000.

O'Keefe, Gerald T.: *See*—
Baba, Takaaki; and O'Keefe, Gerald T., 4,620,222, Cl. 358-48.000.

Oki Electric Industry Co., Ltd.: *See*—
Isobe, Minoru, 4,619,389, Cl. 226-79.000.

Okita, Tsutomu; Yamaguchi, Nobutaka; and Hashimoto, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium with electron beam cured magnetic layer. 4,619,855, Cl. 428-143.000.

Okita, Tsutomu; Naruo, Kyoichi; and Hashimoto, Hiroshi, to Fuji Photo Film Co., Ltd. Magnetic recording medium. 4,619,868, Cl. 428-425.100.

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Kamada, Koh; Hashimoto, Hiroshi; Okita, Tsutomu; and Hibino, Noburo, 4,619,856, Cl. 428-143.000.

Okumoto, Yutaka; Ozaki, Toshiyuki; and Komori, Mikio, to Japan Tobacco & Salt Public Corporation, The. Tobacco filter tip attaching apparatus. 4,619,277, Cl. 131-94.000.

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Matsui, Isamu; Uchida, Hiroshi; Sekitani, Noboru; and Okumura, Hirokazu, 4,619,416, Cl. 242-35.50R.

Okumura, Takatoshi, to Nippon Gakki Seizo Kabushiki Kaisha. Electronic musical instrument. 4,619,174, Cl. 84-1.010.

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Olbrich, Hubertus: *See*—
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, 4,619,253, Cl. 218-156.000.

Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, to Henkel Kommanditgesellschaft auf Aktien. Paint stripping foam. 4,619,711, Cl. 134-38.000.

Olin Corporation: *See*—
Habbe, Randall G., 4,619,203, Cl. 102-516.000.

Olin Hunt Specialty Products Inc.: *See*—
Minten, Karl L.; and Pismennaya, Galina, 4,619,741, Cl. 204-15.000.

Olivieri, Antonio; and Pochini, Giovanni, to AGIP Nucleare S.p.A. Impact absorber for containers for nuclear fuel and/or dangerous substances. 4,620,106, Cl. 250-506.100.

Olsen, Randall B. Pyroelectric energy converter element comprising vinylidene fluoride-trifluoroethylene copolymer. 4,620,262, Cl. 361-323.000.

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Kato, Toshikazu, 4,620,246, Cl. 360-96.500.

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Doi, Toshiki; Shinonaga, Hideo; and Omae, Tadayuki, 4,619,969, Cl. 525-93.000.

Omega SA: *See*—
Fontana, Fernando, 4,619,022, Cl. 24-69.00J.

Omofoma, Matthew A.: *See*—
Taylor, Patrick R.; and Omofoma, Matthew A., 4,619,690, Cl. 75-1.00R.

Omura, Tadao: *See*—
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Gruner, Hans; Orsech, Helmuth; and Schrewe, Hans, 4,619,306, Cl. 164-150.000.

Ortiz, John P., to United States of America, Energy. Apparatus for measuring the decontamination factor of a multiple filter air-cleaning system. 4,619,136, Cl. 73-38.000.

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Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,619,869, Cl. 428-480.000.

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Bedford, Timothy J.; and O'Sullivan, Paul J., 4,619,240, Cl. 123-575.000.

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Adrian, Willy; and Holzhauer, Ralf, 4,619,355, Cl. 198-323.000.

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Shoji, Hisataka; and Ouchi, Shigehiro, 4,619,963, Cl. 524-439.000.

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Overton, James R.: *See*—
Lentz, Carl M.; Overton, James R.; and Cornell, David D., 4,620,055, Cl. 585-438.000.

Owens-Illinois, Inc.: *See*—
Thomas, Ian M.; and Tillman, James J., 4,619,719, Cl. 148-188.000.

Oyama, Hiroo, to Stanley Electric Co., Ltd. Headlamp for vehicle. 4,620,269, Cl. 362-80.000.

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Pacific States Cast Iron Pipe Co.: *See*—
Perkins, Jay, 4,619,561, Cl. 406-89.000.

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Ruff, Klemens; Suhr, Ludwig; and Paikert, Paul, 4,619,671, Cl. 55-222.000.

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Pako Corporation: *See*—
Euteneuer, Charles L.; and Diesch, Robert E., 4,619,452, Cl. 271-305.000.

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Pan, Yau-Jung; and Chen, Sheng-Yi. Cylinder lock with anti-picking device. 4,619,124, Cl. 70-419.000.

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Chu, Tsuwei; and Pandeya, Prakash N., 4,619,118, Cl. 62-324.100.

Pant, Paul: *See*—
Jachowski, Johannes; and Pant, Paul, 4,619,692, Cl. 75-10.250.

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Pappas, Michael J.; and Buechel, Frederick F. Spherical kinematic joint. 4,619,658, Cl. 623-22.000.

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Muller, Rolf, 4,620,138, Cl. 318-254.000.

Papuga, Donald M.: *See*—
Matzner, Markus; and Papuga, Donald M., 4,619,975, Cl. 525-437.000.

Paramount Packaging Corporation: *See*—
Thomas, John S., Jr., 4,619,361, Cl. 206-204.000.

Parekh, Girish G., to American Cyanamid Company. Aliphatic isocyanate compounds. 4,619,999, Cl. 544-196.000.

Park-Ohio Industries, Inc.: *See*—
Balzer, Norbert R.; and Soworowski, David R., 4,619,717, Cl. 148-112.000.

Parker-Hannifin Corporation: *See*—
Church, John F.; Stone, Walter H.; and Schaupp, Richard E., 4,619,764, Cl. 210-248.000.

Parker, Sidney G.; and York, Rudy L., to Texas Instruments Incorporated. Mosaic pattern of infrared detectors of different cut off wave lengths. 4,620,209, Cl. 357-30.000.

Parra, Ernest P. Method and apparatus for severing a tubular member. 4,619,556, Cl. 405-195.000.

Parrott, Stephen L.: *See*—
Myers, John W.; Parrott, Stephen L.; and Sughrue, Edward L., 4,619,759, Cl. 208-210.000.

Pascalides, Artemis: *See*—
Christiansen, Jean E.; Fitzgerald, Maryanne; Moeller, Mitchell G.; Pascalides, Artemis; and Vayda, R. Thaddeus, 4,619,660, Cl. 623-46.000.

Patterson, Dianne L.: *See*—
Sasaki, Yukihiko; Lin, Kenneth S.; and Patterson, Dianne L., 4,619,851, Cl. 428-40.000.

Patterson, Richard G., to Mannesmann Tally Corporation. Adjustable load, friction feed, quick tear bar mechanism. 4,619,538, Cl. 400-621.000.

Patti, William. Fresh water flushing kit. 4,619,618, Cl. 440-88.000.

Paul, Bernt-Joachim; and Renz, Roman, to Siemens Aktiengesellschaft. Contact arrangement for vacuum switches. 4,620,074, Cl. 200-144.00B.

Payen International Limited: *See*—
Herrington, Maurice G., 4,619,459, Cl. 277-235.00B.

Peacey, John G.: *See*—
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., 4,619,533, Cl. 374-141.000.

Pearce, Terry A.: *See*—
Jones, Elvis E.; Pearce, Terry A.; Laird, Dacon C., III; and Everitt, James H., 4,619,669, Cl. 44-1.00G.

Peels, Antonius H. P. M.; van den Beld, Antonius J. M.; Bijma, Jan; and Gerritsen, Jan, to U.S. Philips Corporation. Cathode-ray tube. 4,620,134, Cl. 315-15.000.

Peery, John R.: *See*—
Eckenhoff, James B.; Peery, John R.; and Landrau, Felix A., 4,619,652, Cl. 604-415.000.

Pehker, Manfred; Zielinski, Erich; Metz, Josef; and Bierwirth, Adolf P., to Rheinmetall GmbH. Ammunition and magazine for an automatic loading arrangement. 4,619,181, Cl. 89-34.000.

Peiffer, Joseph, to O. Dorries GmbH. Installation for the distribution of sheets. 4,619,571, Cl. 414-130.000.

Pelerin, Joseph J. Dental impression tray. 4,619,610, Cl. 433-41.000.
Pelletier, Albert: *See—*
Lucas, John M.; Kitzinger, Frank; Labuc, Vladimir M.; Peacey, John G.; Pelletier, Albert; and Wint, Gregory A., 4,619,533, Cl. 374-141.000.
Pellolio, Anselmo P., Jr.: *See—*
Moretti, Anthony L.; and Pellolio, Anselmo P., Jr., 4,619,254, Cl. 128-201.230.
Peltola, Pekka O.: *See—*
Henricson, Kaj O.; and Peltola, Pekka O., 4,619,736, Cl. 162-261.000.
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Heinzl, Joachim; Penningsfeld, Hans-Dieter; and Berdelle-Hilge, Peter, 4,620,201, Cl. 346-140.00R.
Penttinen, Kyosti, to Tikkurilan Varitehtaat Oy. Waterproof, weather-resistant and substantially non-stretching textile a method for producing it, and a component made from it. 4,619,854, Cl. 428-99.000.
Penunuri, David: *See—*
Brooks, Robert E.; and Penunuri, David, 4,620,167, Cl. 333-195.000.
Perdue, Terry A., to Heath Company. Sonar ranging/light detection system for use in a robot. 4,620,285, Cl. 364-513.000.
Perez, Jose M.: *See—*
Gritters, Gregory A.; and Perez, Jose M., 4,619,769, Cl. 210-747.000.
Perez, Rafael. Cutting saw for grinding solid materials. 4,619,172, Cl. 83-830.000.
Perinetti, Alberto, to A. Salvi & C. S.p.A. Adjustable vibration damper for stretched suspended cables. 4,620,060, Cl. 174-42.000.
Perkin-Elmer Censor Anstalt: *See—*
Tabarelli, Werner; and Lobach, Ernst, 4,619,524, Cl. 355-53.000.
Perkins, Jay, to Pacific States Cast Iron Pipe Co. Method and apparatus for conveying particulate matter. 4,619,561, Cl. 406-89.000.
Perron, Robert: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,619,791, Cl. 260-549.000.
Perry, Bruce N.: *See—*
Genack, Azriel Z.; and Perry, Bruce N., 4,619,528, Cl. 356-301.000.
Perry, Richard R.: *See—*
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Personal Diagnostics, Inc.: *See—*
Meserol, Peter M.; and Acker, Jesse L., 4,619,530, Cl. 356-440.000.
Persson, John A.; Andrews, Ross E.; and Maola, Michael A., to Lectromelt Corporation. Arc furnace electrode control. 4,620,308, Cl. 373-105.000.
Peters, Donald J.: *See—*
May, Wayne A.; and Peters, Donald J., 4,619,358, Cl. 198-457.000.
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Bakken, Kirby L.; Judson, Robert G.; Miller, William E.; and Peterson, Ronald A., 4,620,243, Cl. 360-77.000.
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., to NPSP po Hydroplastichna Obrabotka na Metalite. Method of and apparatus for forming blanks by hydroplastic deformation. 4,619,129, Cl. 72-56.000.
Petkovic-Luton, Ruzica; and Vallone, Joseph, to Exxon Research and Engineering Co. Composite dispersion strengthened composite metal powders. 4,619,699, Cl. 75-252.000.
Petras, Carl H.: *See—*
Sizer, Theodore, II; Duling, Irl N., III; Petras, Carl H.; and Letzring, Samuel A., 4,620,113, Cl. 307-270.000.
Petrehn, John R. Balloon carriage. 4,619,422, Cl. 244-127.000.
Petrov, Yakim N.: *See—*
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.
Pfizer Inc.: *See—*
Cue, Berkeley W., Jr.; and Moore, Bernard S., 4,620,019, Cl. 549-404.000.
Hamanaka, Ernest S., 4,619,783, Cl. 540-361.000.
Hamanaka, Ernest S., 4,619,924, Cl. 514-195.000.
Ives, Jeffrey L., 4,619,915, Cl. 514-17.000.
Pfohl, Robert L.: *See—*
Uphold, James D.; and Pfohl, Robert L., 4,619,268, Cl. 128-671.000.
Philip Morris Incorporated: *See—*
Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.
Sanders, Edward B.; and Houminer, Yoram, 4,620,004, Cl. 544-357.000.
Philips Petroleum Company: *See—*
Kolts, John H.; and Delzer, Gary A., 4,620,051, Cl. 585-663.000.
Phillips Petroleum Company: *See—*
Boston, Ernest B., 4,619,770, Cl. 210-772.000.
DeLong, Bradley W., 4,619,679, Cl. 62-11.000.
Drake, Charles A.; and Johnson, Marvin M., 4,620,016, Cl. 549-325.000.
Drake, Charles A., 4,620,017, Cl. 549-325.000.
Hopkins, Thomas R., 4,619,898, Cl. 435-190.000.
Horton, Robert L., 4,619,744, Cl. 204-105.00R.
Johnson, Marvin M.; and Nowack, Gerhard P., 4,619,907, Cl. 502-210.000.
Kimble, James B.; and Kolts, John H., 4,620,057, Cl. 585-500.000.
Kimble, Kenneth B.; Bresson, Clarence R.; and Mark, Harold W., 4,619,760, Cl. 209-166.000.
Kolts, John H.; and Delzer, Gary A., 4,620,052, Cl. 585-663.000.
McDaniel, Max P.; and Smith, Paul D., 4,619,980, Cl. 526-96.000.
Murray, Lawrence K., 4,619,812, Cl. 422-156.000.
Myers, John W.; Parrott, Stephen L.; and Sughrue, Edward L., 4,619,759, Cl. 208-210.000.
Webb, Don W.; and Bard, William B., 4,619,901, Cl. 436-55.000.
Welch, M. Bruce, 4,620,053, Cl. 585-664.000.
Physio-Control Corporation: *See—*
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,619,265, Cl. 128-419.00D.
Pickering, Mark A., to Carrier Corporation. Flame radiator structure. 4,619,604, Cl. 431-353.000.
Pieczykolan, George S., to Central Sprinkler Corp. Sprinkler head. 4,619,327, Cl. 169-38.000.
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Pierce, John M.; and Lehrer, William I., to Fairchild Camera Instrument Corp. Method and apparatus for low pressure chemical vapor deposition. 4,619,844, Cl. 427-248.100.
Pierce, William G. Apparatus for dewatering fibrous materials. 4,619,194, Cl. 100-127.000.
Piet, Meyer, to Futurecraft Corporation. Fluid flow control device. 4,619,285, Cl. 137-68.200.
Piken, Stuart. Scalp cleaner. 4,619,014, Cl. 15-244.00R.
Pilkington P.E. Limited: *See—*
Taylor, Hylton, 4,619,863, Cl. 428-221.000.
Pinckney Molded Plastics, Inc.: *See—*
Kreeger, Elsmer W., 4,619,366, Cl. 206-507.000.
Pintchovski, Faivel S., to Motorola, Inc. Selective titanium silicide formation. 4,619,038, Cl. 29-590.000.
Pioneer Electronic Corp.: *See—*
Yasukawa, Kenichiro, 4,620,158, Cl. 329-50.000.
Piova, Jean-Luc A.: *See—*
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Pismennaya, Galina: *See—*
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Pitney Bowes Inc.: *See—*
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Pittway Corporation: *See—*
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Plahmer, Thomas G., to Rexnord Inc. Wearing part diagnostic system employing tracer elements. 4,620,185, Cl. 340-682.000.
Platt, Sterling B., to Champion International Corporation. Log-peeling lathe. 4,619,299, Cl. 144-357.000.
Pledger, James R.: *See—*
Leonard, Eric M.; Fister, Robert V.; and Pledger, James R., 4,619,804, Cl. 264-220.000.
Plessey Overseas Limited: *See—*
Moon, Philip A. K., 4,620,114, Cl. 307-350.000.
Plicon Corporation: *See—*
Papciak, Walter A.; Hoffman, Karl K.; Engel, Roger; and Wieczorek, Adam, 4,620,247, Cl. 360-97.000.
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Plumridge, Lawrence H. C. Exercise device. 4,619,453, Cl. 272-117.000.
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Pochini, Giovanni: *See—*
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Polak, Anthony J.: *See—*
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Polaroid Corporation, Patent Dept.: *See—*
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,619,784, Cl. 540-593.000.
Poley, Kenneth P.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,619,215, Cl. 114-56.000.
Polifarma S.p.A.: *See—*
Di Stazio, Giovanni; Politi, Vincenzo; Margonelli, Andrea; De Luca, Giovanna; and Materazzi, Mario, 4,619,916, Cl. 514-18.000.
Politi, Vincenzo: *See—*
Di Stazio, Giovanni; Politi, Vincenzo; Margonelli, Andrea; De Luca, Giovanna; and Materazzi, Mario, 4,619,916, Cl. 514-18.000.
Polke, Reinhard: *See—*
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Polysar Limited: *See—*
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Pool, L. Franklin, to Dart Industries Inc. Electrosurgical pencil providing blade isolation. 4,619,258, Cl. 128-303.140.
Popovich, Paul D.: *See—*
Newell, Alton S.; Newell, A. Scott, Jr.; Popovich, Paul D.; and Ewing, John R., 4,619,029, Cl. 29-402.050.
Porta, Augusto; and Kulhanek, Antonin, to Battelle Memorial Institute. Process for the electrochemical decontamination of water polluted

by pathogenic germs with peroxide formed in situ. 4,619,745, Cl. 204-151.000.
Potolsky, Abraham I.; and Blaser, Anton J. Blood transfusion connector assembly. 4,619,640, Cl. 604-7.000.
Poupko, Raphi: *See*—
Zimmermann, Herbert; Poupko, Raphi; Luz, Zeev; and Billard, Jean, 4,619,788, Cl. 260-410.500.
Power-Science, Inc.: *See*—
Cooper, Edward, 4,620,149, Cl. 324-103.00P.
PPG Industries, Inc.: *See*—
Delaney, James M.; and Jozwiak, Edward L., 4,619,746, Cl. 204-181.100.
Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., 4,619,952, Cl. 523-409.000.
Schultz, Stephen J.; Huebner, John F.; Wiedor, Duane E.; and Pribish, Dennis S., 4,620,309, Cl. 373-128.000.
Prabhu, Ashok N.; Conlon, Edward J.; and Sechi, Franco N., to RCA Corporation. Method of fabricating thick film electrical components. 4,619,836, Cl. 427-41.000.
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Pratt, Donna K.: *See*—
Terrell, Jamie B.; and Pratt, Donna K., 4,619,318, Cl. 166-55.000.
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Preformed Line Products Company: *See*—
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Press, Jeffery B.: *See*—
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Press-Seal Gasket Corporation: *See*—
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Pribish, Dennis S.: *See*—
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Price Pfister, Inc.: *See*—
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Lam, Bing L.; and Pridgen, Lendon N., 4,620,001, Cl. 544-310.000.
Privett, Eric B. Method and apparatus for irrigating plants. 4,619,072, Cl. 47-59.000.
Proach, Donald J.: *See*—
Ades, Adrian R.; Pribis, Paul B.; and Proach, Donald J., 4,620,086, Cl. 219-552.000.
Procter & Gamble Company, The: *See*—
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Proctor & Schwartz Inc.: *See*—
George, Kurudamannil A.; and Zagorzycki, Peter E., 4,619,576, Cl. 414-300.000.
Protzmann, Donald E.: *See*—
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Provincial Holdings Ltd.: *See*—
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Prud'homme van Reine, Peter R., to U.S. Philips Corporation. Lamp with discharge vessel made of densely sintered translucent aluminium oxide. 4,620,131, Cl. 313-636.000.
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Puetz, Cornelius: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, 4,619,683, Cl. 65-351.000.
Pulker, Hans K.: *See*—
Moll, Eberhard; Pulker, Hans K.; and Haag, Walter, 4,619,748, Cl. 204-192.310.
Purkey, Richard E.: *See*—
Williams, William J.; and Purkey, Richard E., 4,619,437, Cl. 251-81.000.
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Godwin, William R.; and Quattrocchi, Salvatore, 4,620,069, Cl. 179-175.30R.
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Radzins, Edmund; and Kenney, Timothy J., to Curt G. Joa, Inc. Pad turning apparatus. 4,619,357, Cl. 198-412.000.
Raghavan, Palanichamy: *See*—
Bushnell, William J.; Hemmeter, Richard W.; and Raghavan, Palanichamy, 4,620,066, Cl. 179-27.00D.
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, to Cyanamid Agricultural de Puerto Rico, Inc. Synthesis of intermediates for tetramisole, levamisole and their derivatives. 4,620,009, Cl. 548-155.000.
Rai-Radio Televisione Italiana: *See*—
D'Amato, Paolo; and Salvadorini, Rolando, 4,620,218, Cl. 358-12.000.
Rajaram, Babu: *See*—
Krause, Charles A.; and Rajaram, Babu, 4,620,186, Cl. 340-703.000.
Ramachandran, Pallassana N.; and Grand, Paul S., to Colgate Palmolive Co. Fabric softening heavy duty liquid detergent and process for manufacture thereof. 4,619,774, Cl. 252-8.700.
Ramesohl, Hubert: *See*—
Herchenbach, Horst; and Ramesohl, Hubert, 4,619,605, Cl. 432-14.000.
Ranco Incorporated: *See*—
Caldwell, Roland B., 4,619,286, Cl. 137-81.100.
Rand Steel Technology [Proprietary] Limited: *See*—
Mitchell, George K., 4,619,443, Cl. 266-220.000.
Rands, Mary. Flexible lubricant applicator. 4,619,345, Cl. 184-109.000.
Ranpak Corp.: *See*—
Ottaviano, Gary W., 4,619,635, Cl. 493-36.000.
Rao, Koppaka V. Neolignans of *Saururus cernuus* L and analogues thereof. 4,619,943, Cl. 514-464.000.
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Heinsohn, George E.; and Rao, Velliyur N. M., 4,620,030, Cl. 560-338.000.
Rasmussen, Henning. Gas distribution arrangement for the admission of a processing gas to an atomizing chamber. 4,619,404, Cl. 239-461.000.
Rasmussen, Jerald K.: *See*—
Charbonneau, Robert R.; Heilmann, Steven M.; Rasmussen, Jerald K.; and Tumey, Michael L., 4,619,867, Cl. 428-355.000.
Rath, Lucien M.; and Dunn, William J., to Kendall Company, The. Connection apparatus for side connection to fluid collection bag. 4,619,648, Cl. 604-326.000.
Rathmann, Thomas M.; Drake, Herbert G.; Mirkovich, Ninko T.; and Lachenbruch, Roger B., to Tegal Corporation. Article transport apparatus. 4,619,573, Cl. 414-222.000.
Ratino, David A.: *See*—
Repperger, Daniel W.; Jennings, Thomas J.; and Ratino, David A., 4,619,506, Cl. 351-243.000.
Ratti, Luigi, to Astra Lakemedel Aktiebolag. Novel synthesis route for bacampicillin. 4,619,785, Cl. 540-318.000.
Raychem Corporation: *See*—
Hawkings, Robert M., 4,619,490, Cl. 339-31.00M.
Moyer, James D., 4,619,180, Cl. 87-57.000.
Raytheon Company: *See*—
Collins, John D., 4,620,192, Cl. 342-128.000.
Saunders, Kenneth J.; and Tustison, Randal W., 4,619,792, Cl. 264-1.200.
RCA Corporation: *See*—
Bolger, Thomas V., 4,620,136, Cl. 315-371.000.
Burrowes, Sherwin D. D., 4,620,219, Cl. 358-20.000.
Chung, Kwong T.; and Triano, Alfred R., 4,620,127, Cl. 313-440.000.
Jastrzebski, Lubomir L., 4,619,033, Cl. 29-571.000.
Kosonocky, Walter F., 4,620,231, Cl. 358-213.000.
Morrell, Albert M.; Hughes, Richard H.; and Barkow, William H., 4,620,133, Cl. 315-15.000.
Naimpally, Saiprasad V.; and Murphy, Wesley W., III, 4,620,220, Cl. 358-40.000.
Prabhu, Ashok N.; Conlon, Edward J.; and Sechi, Franco N., 4,619,836, Cl. 427-41.000.
RDI Limited Partnership: *See*—
Mizzi, Francois; and Bellon, Jean-Louis, 4,620,062, Cl. 178-18.000.
Read, Randol R.; Cox, Everett L.; and Selzler, Randall L., to Standard Oil Company, now Amoco Corporation. Data transfer system. 4,620,279, Cl. 364-200.000.
Reagan, Barbara M.: *See*—
Bresee, Randall R.; and Reagan, Barbara M., 4,619,664, Cl. 8-128.00A.
Reber, Jean-Francois: *See*—
Meier, Kurt; Buhler, Niklaus; and Reber, Jean-Francois, 4,619,838, Cl. 427-53.100.
Recane, Marion L.: *See*—
Tigwell, David C.; and Recane, Marion L., 4,620,190, Cl. 340-985.000.
Reckitt & Colman, S.A.: *See*—
Weiss, Richard; and Delagneau, Hubert, 4,619,824, Cl. 424-16.000.
Redecker, Klaus: *See*—
Hagel, Rainer; and Redecker, Klaus, 4,620,046, Cl. 568-930.000.
Redl, Richard S.; and Redl, Robert F. Umbrella with improved wind-up handle. 4,619,281, Cl. 135-20.00M.
Redl, Robert F.: *See*—
Redl, Richard S.; and Redl, Robert F., 4,619,281, Cl. 135-20.00M.
Redman, Mark D.: *See*—
Lee, Lin-nan; and Redman, Mark D., 4,620,224, Cl. 358-119.000.
Reed, George K.: *See*—
Summa, Gareth D.; Reed, George K.; and Burt, Harold S., 4,619,575, Cl. 414-280.000.
Reed Tool Company: *See*—
Daly, Jeffery E.; and Kotch, Robert J., 4,619,534, Cl. 384-94.000.

Rehrig, James B. Three-sided, stackable material handling crate. 4,619,371, Cl. 220-71.000.
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., to Ciba-Geigy Corporation. Benzoate-stabilized rigid polyvinyl chloride compositions. 4,619,957, Cl. 524-91.000.
Reid, William J., to Ciba-Geigy Corporation. Substituted phenol chain terminator for polyvinyl chloride polymerization. 4,619,978, Cl. 526-84.000.
Reinecke, Paul: *See—*
Elbe, Hans-Ludwig; Jautelat, Manfred; Buchel, Karl H.; Brandes, Wilhelm; Hanssler, Gerd; and Reinecke, Paul, 4,619,940, Cl. 514-383.000.
Reinheimer, Guenter; and Gaul, Norbert, to Ernst Leitz Wetzlar GmbH. Transmitted light and/or incident light inverse microscope. 4,619,503, Cl. 350-511.000.
Reinhold, Karl-Heinz: *See—*
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, 4,619,253, Cl. 218-156.000.
Reinmold, Heinz-Josef: *See—*
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, 4,619,683, Cl. 65-351.000.
Remic Corporation: *See—*
Wieder, Klaus, 4,620,068, Cl. 179-156.00A.
Remington, Scott; and Martino, William L., Jr., to Motorola, Inc. Row decoder. 4,620,299, Cl. 365-230.000.
Renaud-Goud, Louis A. Device for assembling construction elements, notably construction elements made of wood. 4,619,547, Cl. 403-231.000.
Rengersen, Jacob: *See—*
Felthuis, Jacob; Van Laar, Jacobus; and Rengersen, Jacob, 4,619,441, Cl. 266-193.000.
Renz, Peter. Apparatus for cutting off pieces from wire comb binding material. 4,619,165, Cl. 83-246.000.
Renz, Roman: *See—*
Paul, Bernt-Joachim; and Renz, Roman, 4,620,074, Cl. 200-144.00B.
Repperger, Daniel W.; Jennings, Thomas J.; and Ratino, David A., to United States of America, Air Force. Random pattern tracking acceleration tolerance tester. 4,619,506, Cl. 351-243.000.
Rexnord Inc.: *See—*
Plahmer, Thomas G., 4,620,185, Cl. 340-682.000.
Reynolds, Keith H. Support for wheel lug wrench. 4,619,161, Cl. 81-462.000.
Rheinmetall GmbH: *See—*
Pehker, Manfred; Zielinski, Erich; Metz, Josef; and Bierwirth, Adolf P., 4,619,181, Cl. 89-34.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,201, Cl. 102-283.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,202, Cl. 102-443.000.
Rhodes, Wayne A.; and Harrington, Kenneth D., to Touchstone Railway Supply & Mfg. Co., Inc. Radiator frame unit. 4,619,313, Cl. 165-67.000.
Rhone-Poulenc Chimie De Base: *See—*
Gauthier-Lafaye, Jean; and Perron, Robert, 4,619,791, Cl. 260-549.000.
Rice, Cecil L. Teaching aid for CPR. 4,619,617, Cl. 434-265.000.
Richardson, Jennings R. Vehicle desk container. 4,619,386, Cl. 224-277.000.
Richmond Screw Anchor Co., Inc.: *See—*
Lancelot, Harry B., III, 4,619,096, Cl. 52-726.000.
Rickel, Edgar J.: *See—*
Elmer, Willard O.; and Rickel, Edgar J., 4,619,340, Cl. 180-209.000.
Rickelton, William A., to American Cyanamid Company. Recovery of cobalt from ammoniacal solutions containing cobalt and nickel. 4,619,816, Cl. 423-139.000.
Ricoh Company, Ltd.: *See—*
Anderson, Carl P.; and Mayer, Edward F., 4,619,450, Cl. 271-35.000.
Hashimoto, Mitsuru, 4,619,878, Cl. 430-56.000.
Iiyama, Kiyotaka; and Inaba, Nirohiko, 4,620,205, Cl. 346-204.000.
Imai, Chikara, 4,619,522, Cl. 355-14.00D.
Inaba, Norihiko; and Iiyama, Kiyotaka, 4,620,204, Cl. 346-204.000.
Koide, Hiroshi, 4,620,301, Cl. 369-266.000.
Ogawa, Mutsuo; Hashimoto, Takemi; Hara, Kazuyuki; and Kondo, Mitsuru, 4,620,233, Cl. 358-260.000.
Suzaki, Masayuki; Hirota, Tetsuro; Kanno, Tetsuo; and Koguchi, Takeziro, 4,620,249, Cl. 360-99.000.
Takemoto, Takeshi, 4,619,536, Cl. 400-157.200.
Ricoh Systems, Inc.: *See—*
Anderson, Carl P.; and Mayer, Edward F., 4,619,450, Cl. 271-35.000.
Riedl, Reinhold; and Lazarus, Conrad, to Haacon Hebetechnik GmbH. Lifting and depositing device for portable containers, compartments, containers, shelters or the like. 4,619,439, Cl. 254-45.000.
Rieger, Wolfhart: *See—*
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,619,309, Cl. 164-430.000.
Rigaud, Philippe: *See—*
Hammou, Abdelkader; Rigaud, Philippe; and Rousseau, Catherine, 4,619,822, Cl. 423-592.000.
Ringgenberg, Paul D., to Halliburton Company. Packer and actuation portion of tubing conveyed completion system. 4,619,319, Cl. 166-55.100.
Ripoll Garcia-Mansilla, Javier, to Manufacturas De Acero Y Caucho S.A. Stressed reinforcing tendon and structure including such a tendon. 4,619,088, Cl. 52-223.00L.
Rivier, Jean E. F.: *See—*
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,619,914, Cl. 514-15.000.
Rizk, Reda: *See—*
Wallenfang, Gerd; Rizk, Reda; and Michels, Hans-Gottfried, 4,619,239, Cl. 123-506.000.
Roane, Bobby A.: *See—*
Hooper, Robert C.; Verret, Douglas P.; and Roane, Bobby A., 4,619,887, Cl. 430-313.000.
Robbins, Matthew A.: *See—*
Zdanys, John, Jr.; Zaderej, Tony J.; and Robbins, Matthew A., 4,620,077, Cl. 200-331.000.
Robert Bosch GmbH: *See—*
Hain, Josef; and Russeler, Karl-Friedrich, 4,619,238, Cl. 123-502.000.
Wendland, Broder; and Uhlenkamp, Dirk, 4,620,225, Cl. 358-141.000.
Robert Linkletter Associates, Ltd.: *See—*
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,619,370, Cl. 215-225.000.
Roberts, Douglas H.: *See—*
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,619,265, Cl. 128-419.00D.
Roberts Filter Manufacturing Company: *See—*
Roberts, Robert L., 4,619,765, Cl. 210-289.000.
Roberts, Joan. Disposable toddler training panty. 4,619,649, Cl. 604-396.000.
Roberts, Preston L.: *See—*
Butt, James A.; Mondal, Kalyan; and Roberts, Preston L., 4,620,283, Cl. 364-493.000.
Roberts, Robert L., to Roberts Filter Manufacturing Company. Filter bottom construction. 4,619,765, Cl. 210-289.000.
Robertson, David B.: *See—*
Stolar, Mike; Robertson, David B.; and Cichy, Mitchell J., 4,619,231, Cl. 123-333.000.
Robertson, Philip D., to Xanar, Inc. Filter for laser surgery smoke evacuation system. 4,619,672, Cl. 55-316.000.
Robinson, Douglas J. Anode insulator for electrolytic cell. 4,619,751, Cl. 204-267.000.
Robinson, Michael, to SCM Chemicals Limited. Chlorination of iron-containing metaliferous material. 4,619,815, Cl. 423-74.000.
Robison, Robert L., to Eli Lilly and Company. Stable oncolytic formulations. 4,619,935, Cl. 514-281.000.
Robitschko, Peter: *See—*
Kneib, Rudi; Emmer, Ludwig; and Robitschko, Peter, 4,619,477, Cl. 296-37.130.
Rockefeller University, The: *See—*
Kappas, Attallah; and Drummond, George S., 4,619,923, Cl. 514-185.000.
Rockwell International Corporation: *See—*
Barkhoudarian, Sarkis; August, Rudolf R.; and Maram, Jonathan M., 4,620,093, Cl. 250-231.00P.
Fisher, Jimmie L.; Kovalan, Mark A.; and Wiscons, Bryon L., 4,620,277, Cl. 364-200.000.
Katz, Ellis, 4,619,290, Cl. 138-39.000.
Schoeneweis, E. Frederick; and Duffey, Donn W., 4,619,283, Cl. 137-15.000.
Trachman, Edward G.; and Roper, Daniel W., 4,619,151, Cl. 74-335.000.
Roederhoff, Bernhard: *See—*
Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, 4,619,711, Cl. 134-38.000.
Rogen, Neil E.: *See—*
Adnyana, Dewa N.; and Rogen, Neil E., 4,619,320, Cl. 166-65.100.
Rohm GmbH: *See—*
Schroeder, Gunter; and Baumgartner, Ehrenfried, 4,620,029, Cl. 560-204.000.
Rohm, Gunter H. Hammer-drill chuck. 4,619,460, Cl. 279-19.000.
Rohm, Gunter H. Hammer drill apparatus. 4,619,461, Cl. 279-19.300.
Rohm and Haas Company: *See—*
Kielbania, Andrew J.; and Kim, Samuel S., 4,619,964, Cl. 524-460.000.
Rohr, Wolfgang: *See—*
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.
Rolff, Rolf: *See—*
Nitsche, Detlev; and Rolff, Rolf, 4,619,740, Cl. 204-15.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, to Rheinmetall GmbH. Graduated-density packed propellant charge. 4,619,201, Cl. 102-283.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, to Rheinmetall GmbH. Multiple purpose ammunition. 4,619,202, Cl. 102-443.000.
Roos, Paul F. Tap. 4,619,377, Cl. 222-83.000.
Roper, Daniel W.: *See—*
Trachman, Edward G.; and Roper, Daniel W., 4,619,151, Cl. 74-335.000.
Rosaen, Lars O., to Universal Flow Monitors, Inc. Flow meter with displaceable flow rate indicator. 4,619,139, Cl. 73-198.000.
Rose, David; Lieske, Edgar; and Maak, Norbert, to Henkel Kommanditgesellschaft auf Aktien. Hair dyes containing amino-nitrobenzoic acid or amino-nitrobenzene sulfonic acids as substantive dyes. 4,619,666, Cl. 8-414.000.

Rosenstatter, Otto, to Durr-Dental GmbH & Co. KG. Tooth cleaning apparatus. 4,619,009, Cl. 15-29.000.

Ross, Danny E.; and Bond, Larry O., to Motorola, Inc. Grounding ring. 4,619,275, Cl. 128-783.000.

Rostin, Gunther; Scheer, Erich; Kolb, Dieter; and Werner, Karl H., to Fichtel & Sachs AG. Pressure plate for a motor vehicle friction clutch. 4,619,354, Cl. 192-89.00B.

Roth, Alfred: *See—*
Janthur, Ingo W.; Roth, Alfred; and Odry, Stefan, 4,619,073, Cl. 49-74.000.

Rothwell, Harold L., Jr.: *See—*
Keeffe, William M.; Gungle, W. Calvin; Rothwell, Harold L., Jr.; and Krasko, Zeya K., 4,620,130, Cl. 313-634.000.

Rotoloni, Francis A.: *See—*
Moss, Parry A.; and Rotoloni, Francis A., 4,619,842, Cl. 427-163.000.

Roullet, Alain: *See—*
Dubrulle, Gerard; and Roullet, Alain, 4,619,113, Cl. 62-64.000.

Rousseau, Catherine: *See—*
Hammou, Abdelkader; Rigaud, Philippe; and Rousseau, Catherine, 4,619,822, Cl. 423-592.000.

Roussel, Charles F.: *See—*
Healey, James A.; Duncan, Robert C.; and Roussel, Charles F., 4,619,813, Cl. 422-171.000.

Routledge, James H. Retractable wheel suspension apparatus. 4,619,578, Cl. 414-498.000.

Roux, Christine: *See—*
Lerude, Gerard; and Roux, Christine, 4,620,265, Cl. 361-424.000.

Rowan, Steven M.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Roxey, Timothy E.: *See—*
Keates, Richard H.; Schneider, Richard T.; Roxey, Timothy E.; and Cox, John D., 4,619,657, Cl. 623-6.000.

Roy, Glenn M.: *See—*
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,782, Cl. 560-122.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., 4,619,834, Cl. 426-548.000.

Rozporka, Richard E.: *See—*
Cook, Randall W.; Rozporka, Richard E.; and Jones, Robert S., 4,620,255, Cl. 360-132.000.

Rubey, Ulyss R., to Media Recovery, Inc. Magnetic computer tape cleaner. 4,620,256, Cl. 360-137.000.

Rubin, Howard. Apparatus and method for transporting and preserving perishable test samples. 4,619,678, Cl. 62-4.000.

Rubner, Roland: *See—*
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,619,500, Cl. 350-341.000.

Ruckert, Hans: *See—*
Wingen, Rainer; Geissler, Ulrich; and Ruckert, Hans, 4,619,885, Cl. 430-260.000.

Rudolf, Reiner, to Hengstler GmbH Geschaftsbereich Haller-Relais. Electromagnetic relay with switch spring. 4,620,172, Cl. 335-78.000.

Ruehl, William E., to Illinois Tool Works Inc. Telephone line tester. 4,620,070, Cl. 179-175.30R.

Ruff, Klemens; Suhr, Ludwig; and Paikert, Paul, to GEA Luftkuehlergesellschaft Happel GmbH & Co. Energy transfer device for desulfurizing installation. 4,619,671, Cl. 55-222.000.

Ruhland, John G., to Xerox Corporation. Development apparatus. 4,619,517, Cl. 355-3.0DD.

Ruppel, Peter: *See—*
Schaut, Josef; and Ruppel, Peter, 4,619,525, Cl. 355-64.000.

Rushansky, Yuliy, to Slater Electric Inc. Three position electrical switch. 4,620,071, Cl. 200-6.0BA.

Russeler, Karl-Friedrich: *See—*
Hain, Josef; and Russeler, Karl-Friedrich, 4,619,238, Cl. 123-502.000.

Rutens, Imants R. Waterbed, sofa and table. 4,619,005, Cl. 5-2.00R.

RWD-Datentechnik GmbH: *See—*
Fremery, Johan K.; Lindenau, Bernd; and Witthauer, Klaus, 4,619,144, Cl. 73-708.000.

S.A.I.A.G. S.p.A.: *See—*
Azzola, Roberto; and Carrera, Luciano, 4,619,077, Cl. 49-497.000.

S. C. Johnson & Son, Inc.: *See—*
Konicek, Tim R., 4,619,383, Cl. 222-556.000.

S.D.S. Industries, Inc.: *See—*
Day, Robert L.; and Day, Robert H., 4,619,540, Cl. 403-24.000.

Saab-Scania Aktiebolag: *See—*
Hellstrom, Gunnar, 4,619,182, Cl. 89-37.160.

Saari, Walfred S.: *See—*
Engelhardt, Edward L.; and Saari, Walfred S., 4,619,927, Cl. 514-218.000.

Sackett, Robert L. Pool alarm system. 4,620,181, Cl. 340-566.000.

Sadahiro, Hisanori, to Sakai Heavy Industries Ltd. Vibration proof suspension type vibrating roller. 4,619,552, Cl. 404-117.000.

Safe-T-Stop Inc.: *See—*
Stolar, Mike; Robertson, David B.; and Cichy, Mitchell J., 4,619,231, Cl. 123-333.000.

Sagues, Paul: *See—*
Auslander, David M.; Tomizuka, Masayoshi; Sagues, Paul; Ishida, Takashi; and Kamiyama, Shuichi, 4,619,237, Cl. 123-491.000.

Saiki, Noritsugu; and Konishi, Tadashi, to Teijin Limited. Process for preparation of high-molecular weight polyester. 4,619,987, Cl. 528-274.000.

Sainen, Tsutomu; and Asai, Takeshi, to Tsudakoma Corp. Method of and apparatus for controlling motor-driven let-off and take-up system for looms. 4,619,294, Cl. 139-99.000.

Saint-Gobain Cinematique et Controle: *See—*
Ducloux, Marcel L., 4,620,090, Cl. 250-223.00B.

Saint-Gobain Recherche: *See—*
Tetaz, Roger; and Vizet, Philippe, 4,619,681, Cl. 65-29.000.

Saint Martin, Francois-Xavier: *See—*
Delacour, Jacques; Levallois, Emile; Antier, Patrick; and Saint Martin, Francois-Xavier, 4,619,762, Cl. 210-170.000.

St-Onge, Michel C.: *See—*
Twardawa, Philip A.; and St-Onge, Michel C., 4,619,424, Cl. 244-151.00B.

Saito, Eiichi: *See—*
Takahashi, Michihiko; Saito, Eiichi; Okano, Takeshi; and Nakaoka, Sadaaki, 4,619,519, Cl. 355-11.000.

Saito, Kenichi: *See—*
Takahashi, Tetsuo; Taguchi, Yoshinobu; and Saito, Kenichi, 4,619,043, Cl. 29-840.000.

Sakaguchi, Katsumi: *See—*
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.

Sakai Heavy Industries Ltd.: *See—*
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Sakai, Ikuo; Karimoto, Hiroyasu; and Nakayama, Yasuhiko, to Matsushita Electric Industrial Co., Ltd. Magnetic amorphous alloys comprising Co, Fe, Zr, and Nb. 4,619,720, Cl. 148-403.000.

Sakai, Yasuhito, to Fuji Jukogyo Kabushiki Kaisha. System for detecting the transmission ratio in an infinitely variable transmission. 4,619,157, Cl. 74-689.000.

Sakakibara, Shingo: *See—*
Hotta, Tadahiko; and Sakakibara, Shingo, 4,619,035, Cl. 29-576.00C.

Sakuma, Kuniharu: *See—*
Iimura, Ikurou; Sakuma, Kuniharu; and Iwabuchi, Haruo, 4,619,213, Cl. 112-273.000.

Salama, Mamdouh M.; Myers, Roderick J.; Thomason, William H.; and Joosten, Michael H., to Conoco Inc. Corrosion protection for mooring and riser elements of a tension leg platform. 4,619,557, Cl. 405-211.000.

Salk Institute for Biological Studies, The: *See—*
Vale, Wylie W., Jr.; and Rivier, Jean E. F., 4,619,914, Cl. 514-15.000.

Salladay, David G.; and Achorn, Frank P., to Tennessee Valley Authority. Pressure reactor for producing diammonium phosphate. 4,619,684, Cl. 71-34.000.

Salter, Robert S.; Boorman, Roy S.; and Wilkomirsky, Igor A. E., to Provincial Holdings Ltd. Process for the recovery of non-ferrous metals from sulphide ores and concentrates. 4,619,814, Cl. 423-27.000.

Salvadorini, Rolando: *See—*
D'Amato, Paolo; and Salvadorini, Rolando, 4,620,218, Cl. 358-12.000.

Samaritoni, Jack G.: *See—*
Abdulla, Riaz F.; and Samaritoni, Jack G., 4,619,686, Cl. 71-92.000.

Sampson, Robert W.: *See—*
Schnell, Robert P.; Sampson, Robert W.; Pacanowski, Ronald F.; and Bruggema, Donald J., 4,620,284, Cl. 364-498.000.

Samson, Wilfred J.: *See—*
Frisbie, Jeffrey S.; and Samson, Wilfred J., 4,619,263, Cl. 128-344.000.

Samuelsson, Bo Å.: *See—*
Hertz, Carl H.; and Samuelsson, Bo Å., 4,620,196, Cl. 346-1.100.

Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., to Eastman Kodak Company. 2-pyrimidyl alkanesulfonates. 4,620,002, Cl. 544-318.000.

Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., to Eastman Kodak Company. Acid salts of 1-(cyanoalkyl)-4-guanylpiperazines. 4,620,006, Cl. 544-402.000.

Sanden Corporation: *See—*
Takatoshi, Koitabashi, 4,619,351, Cl. 192-35.000.

Sanders, Edward B.; and Houminer, Yoram, to Philip Morris Incorporated. Polyheterocyclic compounds. 4,620,004, Cl. 544-357.000.

Sandford, Donald L.: *See—*
Helms, Richard A.; Timm, Gerald W.; and Sandford, Donald L., 4,619,251, Cl. 128-79.000.

Sandoz Ltd.: *See—*
Baumann, Werner, 4,619,993, Cl. 534-735.000.
Gerber, Hans; and Schleusener, Eckart, 4,619,703, Cl. 106-271.000.
Matzinger, Peter, 4,619,991, Cl. 534-588.000.

Sandoz Pharm. Corp.: *See—*
Lee, Mark L.; and Jaeggi, Christian, 4,619,917, Cl. 514-77.000.

Saner, Remo: *See—*
Overath, Friedhelm; and Saner, Remo, 4,619,470, Cl. 285-55.000.

Sangati, Guido, to Sangati S.p.A. Control system for grinding mill. 4,619,408, Cl. 241-34.000.

Sangati S.p.A.: *See—*
Sangati, Guido, 4,619,408, Cl. 241-34.000.

Sano, Toshihiro: *See*—
Mitani, Katsuya; Sano, Toshihiro; Nomura, Nobutaka; Numata, Kou; and Utino, Megumi, 4,620,273, Cl. 364-136.000.

Sano, Toshio; Takahashi, Masaharu; Murakoshi, Yoichi; and Matsuno, Kenichi, to Agency of Industrial Science & Technology; and Ministry of International Trade & Industry. Electromagnetic forming method by use of a driver. 4,619,127, Cl. 72-56.000.

Sano, Yoshihiro; Iwatani, Fumio; Kubo, Takao; and Miki, Yoshiteru, to Hitachi, Ltd. Carrier relay system. 4,620,257, Cl. 361-68.000.

Sansom, Harry C., deceased: *See*—
Marwick, Alan D.; and Sansom, Harry C., deceased, 4,619,030, Cl. 29-404.000.

Sansom, Janet Mary, administratrix: *See*—
Marwick, Alan D.; and Sansom, Harry C., deceased, 4,619,030, Cl. 29-404.000.

Santo, Phillip J. Method of making a decorative composite panel. 4,619,800, Cl. 264-139.000.

Santrade Limited: *See*—
Smith, Ulf K. H.; and Lindstrom, Jan N., 4,619,866, Cl. 428-336.000.

Sanvito, Angelo: *See*—
Magnoni, Pierangelo; Strada, Pier E.; Cavagnis, Walter; and Sanvito, Angelo, 4,619,006, Cl. 5-68.000.

Sanyo Electric Co., Ltd.: *See*—
Ishikura, Yoshikazu; Watanabe, Akira; and Matsumoto, Takanao, 4,619,873, Cl. 429-48.000.

Sapienza, Richard S.; Slegeir, William A.; O'Hare, Thomas E.; and Mahajan, Devinder. Low temperature catalysts for methanol production. 4,619,946, Cl. 518-700.000.

Sartor, Leo; and Gobbo, Franco, to Caber Italia S.p.A. Tightening and adjusting device particularly for ski boots. 4,619,057, Cl. 36-50.000.

Sartorius GmbH: *See*—
Behrend, Lothar; Ober, Jurgen; Knothe, Erich; and Melcher, Franz-Josef, 4,619,337, Cl. 177-210.00R.

Sasaki, Junzo: *See*—
Ueda, Kazuhiko; Hitomi, Mitsuo; and Sasaki, Junzo, 4,619,226, Cl. 123-52.0MB.

Sasaki, Noboru, to France Bed Co., Ltd. Spring unit. 4,619,445, Cl. 267-100.000.

Sasaki, Yukihiko; Lin, Kenneth S.; and Patterson, Dianne L., to Avery International Corporation. Adhesive compositions. 4,619,851, Cl. 428-40.000.

Sassa, Yuusei: *See*—
Yoshieda, Keiichi; and Sassa, Yuusei, 4,619,141, Cl. 73-865.900.

Sassower, Stanley P.: *See*—
Fulton, Donald E.; and Sassower, Stanley P., 4,620,272, Cl. 363-53.000.

Satake, Satoshi: *See*—
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, 4,619,310, Cl. 164-448.000.

Sato, Hideo: *See*—
Horie, Seiji; Makino, Naonori; and Sato, Hideo, 4,619,880, Cl. 430-58.000.
Makino, Naonori; Horie, Seiji; and Sato, Hideo, 4,619,881, Cl. 430-77.000.

Sato, Joshiro: *See*—
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.

Sato, Kazuhiko: *See*—
Okamoto, Yoshiyuki; Sato, Kazuhiko; Uryu, Shunji; and Morita, Kiyoshi, 4,619,080, Cl. 51-251.000.

Sato, Kouzou: *See*—
Kawata, Ken; Yabuki, Yoshiharu; Sato, Kouzou; and Hirai, Hiroyuki, 4,619,888, Cl. 430-353.000.

Sato, Kyosaku, to Polysar Limited. Thermoplastic polymer compositions. 4,619,962, Cl. 524-401.000.

Sato, Masami, to Stephano & Co., Ltd.; and Sato, Masami. Apparatus for producing refreshable dry meat. 4,619,054, Cl. 34-92.000.

Sato, Noriharu: *See*—
Amano, Keijiro; Hayase, Isao; Kishi, Atsuo; and Sato, Noriharu, 4,619,595, Cl. 418-83.000.

Sato, Ryo: *See*—
Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, 4,619,687, Cl. 71-92.000.

Satoh, Kenji: *See*—
Anzawa, Haruyoshi; Satoh, Kenji; Tanaka, Yoshinari; and Okaya, Takuji, 4,619,849, Cl. 428-35.000.

Saunders, Kenneth J.; and Tustison, Randal W., to Raytheon Company. Process for making an optically transmissive body. 4,619,792, Cl. 264-1.200.

Sauvage, Marc: *See*—
Delestre, Xavier; and Sauvage, Marc, 4,620,168, Cl. 333-202.000.

Savi, Antonio: *See*—
De Faveri, Americo; Zanvettor, Sergio; and Savi, Antonio, 4,620,166, Cl. 333-184.000.

Sawada, Kenji: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,620,202, Cl. 346-140.00R.

Sayles, Scott M.: *See*—
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,619,758, Cl. 208-85.000.

Scavennec, Andre ; and Ankri, David. Phototransistor of the type having an emitter-base heterojunction. 4,620,210, Cl. 357-30.000.

Schad, Charles A.: *See*—
Bohm, Jurgen; and Schad, Charles A., 4,619,134, Cl. 73-3.000.

Schadel, Gunter: *See*—
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.

Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, to Bayer Aktiengesellschaft. Process for the production of coated substrates. 4,619,966, Cl. 524-589.000.

Schaible, Walter; and Mast, Peter, to Dr. Ing. h.c.F. Porsche AG. Wheel suspension. 4,619,466, Cl. 280-669.000.

Schanzer, Harry, to Mount Sinai School of Medicine of The City University of New York. Coaxial double lumen anteriovenous grafts. 4,619,641, Cl. 604-8.000.

Schaupp, Richard E.: *See*—
Church, John F.; Stone, Walter H.; and Schaupp, Richard E., 4,619,764, Cl. 210-248.000.

Schaut, Josef; and Ruppel, Peter. Camera casing for microfilm cameras. 4,619,525, Cl. 355-64.000.

Scheer, Erich: *See*—
Rostin, Gunther; Scheer, Erich; Kolb, Dieter; and Werner, Karl H., 4,619,354, Cl. 192-89.00B.

Schefczik, Ernst: *See*—
Bergmann, Udo; Dix, Johannes P.; Hansen, Guenter; and Schefczik, Ernst, 4,619,992, Cl. 534-733.000.

Schellenberg, Claude: *See*—
Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, 4,619,753, Cl. 204-290.00F.

Scherer, Gunther: *See*—
Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, 4,619,753, Cl. 204-290.00F.

Scherer, Michael: *See*—
Hessberger, Gerhard; and Scherer, Michael, 4,619,755, Cl. 204-298.000.

Schering Aktiengesellschaft: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Topert, Michael, 4,619,922, Cl. 514-180.000.
Nitsche, Detlev; and Rolff, Rolf, 4,619,740, Cl. 204-15.000.

Schering Corporation: *See*—
Gold, Elijah H.; and Chang, Wei K., 4,619,919, Cl. 514-166.000.

Schick, Timothy: *See*—
Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Schick, Timothy; and Untermyer, Samuel, II, 4,620,100, Cl. 250-358.100.

Schleusener, Eckart: *See*—
Gerber, Hans; and Schleusener, Eckart, 4,619,703, Cl. 106-271.000.

Schlichting, Johannes; and Halwass, Kerstin, to Jenoptik Jena G.m.b.H. Automatic optical focusing device. 4,620,089, Cl. 250-201.000.

Schlippes, Hans-Josef. Jutted joint structures. 4,619,546, Cl. 403-171.000.

Schluderberg, Donald C., to Babcock & Wilcox Company, The. Steam generation and reheat apparatus. 4,619,809, Cl. 376-402.000.

Schlunt, Richard S.; Schmid, Hans-Peter; and Fetterly, Donald R., to General Dynamics, Pomona Division. Optical matrix multiplier. 4,620,293, Cl. 364-845.000.

Schmelzer Corporation: *See*—
Heimnick, Paul; and Johnson, LeRoy B., 4,619,478, Cl. 296-153.000.

Schmid, Hans-Peter: *See*—
Schlunt, Richard S.; Schmid, Hans-Peter; and Fetterly, Donald R., 4,620,293, Cl. 364-845.000.

Schmid, Karlheinz; and Bonfert, Heinrich, to Gebrueder Heller, Maschinenfabrik GmbH. Milling machine, especially crankshaft milling machine. 4,619,565, Cl. 409-135.000.

Schmidbaur, Hubert; Dorzbach, Cornelia; and Bowmaker, Graham, to Hoecht Aktiengesellschaft. Bis-phosphonium salts and process for making them. 4,620,020, Cl. 556-18.000.

Schmidt, Gregory E.; Leung, Linus K.; Beck, Lawrence J.; and Chang, David S., to Standard Oil Company (Indiana). Method and apparatus for controlling polybutene production. 4,620,049, Cl. 585-501.000.

Schmidt, John W., III, to Hougen, Everett Douglas. Shaker for paint containers. 4,619,532, Cl. 366-110.000.

Schmitt, Anita: *See*—
Anhauser, Dieter; Kreitlow, Gerhard; Olbrich, Hubertus; Reinhold, Karl-Heinz; and Schmitt, Anita, 4,619,253, Cl. 218-156.000.

Schneider, Richard T.: *See*—
Keates, Richard H.; Schneider, Richard T.; Roxey, Timothy E.; and Cox, John D., 4,619,657, Cl. 623-6.000.

Schnell, Robert P.; Sampson, Robert W.; Pacanowski, Ronald F.; and Bruggema, Donald J., to UOP Inc. Qualitative and quantitative analysis using Raman scattering. 4,620,284, Cl. 364-498.000.

Schoeneweis, E. Frederick; and Duffey, Donn W., to Rockwell International Corporation. Stem seal for tapered lubricated plug valves. 4,619,283, Cl. 137-15.000.

Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Tunnell, George W.; and Zucker, Martin S., to General Electric Company. Automated monitoring of fissile and fertile materials in incinerator residue. 4,620,099, Cl. 250-358.100.

Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Schick, Timothy; and Untermyer, Samuel, II, to General Electric Company. Automated monitoring of fissile and fertile materials in large waste containers. 4,620,100, Cl. 250-358.100.

Schoettle, Klaus, to BASF Aktiengesellschaft. Tape cassette. 4,619,420, Cl. 242-198.000.

Schols, John A.; and Yu, Kee C., to Dow Chemical Company, The. Low styrene emission vinyl ester resin employing polyacrylates for fiber-reinforced applications. 4,619,953, Cl. 523-465.000.

Scholz, Eugen, to Hoechst Aktiengesellschaft. Solvent for the determination of water by the Karl Fischer method. 4,619,900, Cl. 436-42.000.

Schoppen, Josef: *See*—
Gorke, Klaus; and Schoppen, Josef, 4,619,951, Cl. 523-173.000.

Schott Glaswerke: *See*—
Gunthner, Franz, 4,619,682, Cl. 65-64.000.

Schouhamer Immink, Kornelis A., to U.S. Philips Corporation. Method of transmitting information, encoding device for use in the method, and decoding device for use in the method. 4,620,311, Cl. 375-19.000.

Schreiber, William L.: *See*—
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,619,780, Cl. 252-522.00R.
Fujioka, Futoshi; Boden, Richard M.; and Schreiber, William L., 4,620,041, Cl. 568-665.000.
Wiegers, Wilhelmus J.; Sprecker, Mark A.; and Schreiber, William L., 4,619,781, Cl. 252-522.00R.

Schreiner, Peter J.; Bolenbaugh, Daniel L.; and Krebs, David R., to Allied Corporation. Disc brake assembly. 4,619,347, Cl. 188-72.600.

Schrewe, Hans: *See*—
Gruner, Hans; Orsech, Helmuth; and Schrewe, Hans, 4,619,306, Cl. 164-150.000.

Schroder, Helmut, to Werner & Pfleiderer. Baking oven having turntable driven from an external motor whose drive shaft is coupled via a seal to an internal chain. 4,619,607, Cl. 432-162.000.

Schroeder, Gunter; and Baumgartner, Ehrenfried, to Rohm GmbH. Method for making oxalic acid diesters. 4,620,029, Cl. 560-204.000.

Schubert, Gerd: *See*—
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, 4,619,683, Cl. 65-351.000.

Schultz, Gary R.: *See*—
Bryan, Lannie R.; and Schultz, Gary R., 4,619,303, Cl. 152-416.000.

Schultz, Stephen J.; Huebner, John F.; Wiedor, Duane E.; and Pribish, Dennis S., to PPG Industries, Inc. Electric furnace construction. 4,620,309, Cl. 373-128.000.

Schumacher, Heinz O. Process and apparatus for desolventizing flaky or granular vegetable residue material obtained in the extraction with organic solvents. 4,619,053, Cl. 34-12.000.

Schurle, Hermann: *See*—
Daniels, Erwin J.; Kratzer, Bernd; and Schurle, Hermann, 4,619,504, Cl. 351-163.000.

Schwenzer, Michael: *See*—
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,201, Cl. 102-283.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,202, Cl. 102-443.000.

Schwerin, Thomas E. Solder leveler. 4,619,841, Cl. 427-96.000.

Schwirten, Kurt: *See*—
Kummer, Rudolf; and Schwirten, Kurt, 4,619,790, Cl. 260-413.000.

SCM Chemicals Limited: *See*—
Robinson, Michael, 4,619,815, Cl. 423-74.000.

SCM Corporation: *See*—
Gorman, C. Rodney; Evans, James M.; and Traynor, Sean G., 4,620,028, Cl. 560-193.000.
Hwang, Jennie S., 4,619,715, Cl. 148-23.000.

Scott, Andrew: *See*—
Armell, Richard A.; and Scott, Andrew, 4,619,322, Cl. 166-241.000.

Scott, Candice C., executrix: *See*—
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,619,758, Cl. 208-85.000.

Scott, Gary L.: *See*—
Bonzer, William J.; and Scott, Gary L., 4,619,436, Cl. 251-61.100.

Scott, Junius D.: *See*—
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.

Scott, Richard P., deceased: *See*—
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,619,758, Cl. 208-85.000.

Scott, Van E. Clinical catheterization technique and apparatus for performing same. 4,619,644, Cl. 604-53.000.

Scribner, Albert W. Pneumatic feeder for punch presses. 4,619,390, Cl. 226-162.000.

Seador, Thomas G.: *See*—
Davis, Robert I.; and Seador, Thomas G., 4,620,024, Cl. 558-113.000.

Seagate Technology: *See*—
Krause, James N., 4,620,244, Cl. 360-77.000.

Sebag, Henri: *See*—
Vanlerberghe, Guy; and Sebag, Henri, 4,620,037, Cl. 568-36.000.

Sechi, Franco N.: *See*—
Prabhu, Ashok N.; Conlon, Edward J.; and Sechi, Franco N., 4,619,836, Cl. 427-41.000.

Secoroc AB: *See*—
Gustafsson, Christer, 4,619,334, Cl. 175-321.000.

Seely, James R.; and McCabe, Jerry A., to Marketing Displays, Inc. Collapsible sign with flags. 4,619,220, Cl. 116-63.00P.

Seiki, Kazuo: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; and Seiki, Kazuo, 4,619,109, Cl. 57-261.000.

Seiko Epson Kabushiki Kaisha: *See*—
Koto, Haruhiko; Okada, Junichi; Ishii, Hiroshi; and Sawada, Kenji, 4,620,202, Cl. 346-140.00R.

Seiko Instruments & Electronics Ltd.: *See*—
Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, 4,620,102, Cl. 250-427.000.

Seitz, Robert R.: *See*—
Cycyk, Michael A.; and Seitz, Robert R., 4,619,192, Cl. 99-538.000.

Sekercioglu, Ibrahim: *See*—
Stambaugh, Edgel P.; Adair, James H.; Sekercioglu, Ibrahim; and Wills, Roger R., 4,619,817, Cl. 423-266.000.

Seki, Setsuko: *See*—
Kambara, Hideki; and Seki, Setsuko, 4,620,103, Cl. 250-440.100.

Seki, Yoshizo; and Bass, Sidney, to Tomy Kogyo Co. Inc. Construction toy. 4,619,625, Cl. 446-89.000.

Sekitani, Noboru: *See*—
Matsui, Isamu; Uchida, Hiroshi; Sekitani, Noboru; and Okumura, Hirokazu, 4,619,416, Cl. 242-35.50R.

Sellek, Donald A.: *See*—
Davison, Arthur L.; Blackburn, Martin D.; and Sellek, Donald A., 4,620,148, Cl. 324-99.00D.

Selzler, Randall L.: *See*—
Read, Randol R.; Cox, Everett L.; and Selzler, Randall L., 4,620,279, Cl. 364-200.000.

Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., to Casket Shells, Inc. Apparatus for producing shirring. 4,619,211, Cl. 112-132.000.

Semon, William J.: *See*—
Semon, Joseph R.; Semon, William J.; Bonczar, Lawrence J.; Ceresko, Helen; and MacKirdy, William T., 4,619,211, Cl. 112-132.000.

Sengchanh, Chanty, to Development Finance Corporation of New Zealand. Multi-level logic circuit. 4,620,188, Cl. 340-825.870.

Sequentia, Incorporated: *See*—
Warner, Sidney O., II, 4,619,954, Cl. 523-516.000.

Servant, Mireille: *See*—
Hache, Jean C.; and Servant, Mireille, 4,619,505, Cl. 351-211.000.

Seyler, Gerard; and Sloan, Donald R., to Pittway Corporation. Fire extinguisher valve with pressure indicator. 4,619,328, Cl. 169-75.000.

Shaffer, Don T.; and Milyard, Emmert. Cycle apparatus having therapeutic and utility aspects. 4,619,462, Cl. 280-242.00R.

Shah, Gautam N.: *See*—
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., 4,619,395, Cl. 228-4.500.

Shalev, Ilan, to State of Israel Ministry of Defense, Military Industries, The. Gas actuated pistol. 4,619,184, Cl. 89-185.000.

Shamos, Morris H.: *See*—
Teodorescu, Tonel E.; and Banko, William, 4,619,146, Cl. 73-861.540.

Shank, Jeffrey B.; and Troutman, Timmy D., to GTE Products Corporation. Fiber optic cleaving tool. 4,619,387, Cl. 225-96.500.

Shannon, David M.: *See*—
Lam, Chiu T.; and Shannon, David M., 4,620,043, Cl. 568-801.000.

Sharbaugh, Amandus H.: *See*—
Dietz, Peter W.; and Sharbaugh, Amandus H., 4,620,145, Cl. 324-54.000.

Sharkany, Edward J.; and Mathews, Richard J., Sr., to Acme United Corporation. Surgical stapling instrument. 4,619,391, Cl. 227-19.000.

Sharma, Shri C., to Warner-Lambert Company. Dietary fiber composition and process of manufacture. 4,619,831, Cl. 426-93.000.

Sharp Kabushiki Kaisha: *See*—
Tanaka, Seiichi; and Nagano, Fumikazu, 4,620,236, Cl. 358-293.000.
Tani, Zempei; Ebina, Kiyoshi; Ichikawa, Osamu; and Imaizumi, Mamoru, 4,620,094, Cl. 250-231.0SE.

Shattock, Alan G.; and Morgan, Bridget M. Process for obtaining delta antigen of hepatitis D virus and use of said antigen as a diagnostic agent. 4,619,896, Cl. 435-7.000.

Sheehan, Joseph C. M.; and Dorr, Bruce P., to Kells Medical, Inc. Collapsible container frame. 4,620,319, Cl. 383-33.000.

Sheehan, Robert K. Connector for a helically grooved metallic conduit. 4,619,332, Cl. 174-65.00R.

Shell California Production Inc.: *See*—
van Mierlo, Franciscus J. A., 4,619,326, Cl. 166-382.000.

Shell Oil Company: *See*—
Denes, Lucian R., 4,620,000, Cl. 544-235.000.
van der Burgt, Maarten J., 4,619,400, Cl. 239-102.100.

Shelley, Marlin C. System and method for documenting and checking cable interconnections. 4,620,282, Cl. 364-489.000.

Shelton, Harold D.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Shephard, Margaret C.: *See*—
Worthington, Paul A.; and Shephard, Margaret C., 4,620,011, Cl. 548-262.000.

Shepheard, John R.: *See*—
Donaldson, Timothy P.; Knight, Raymond P.; and Shepheard, John R., 4,620,135, Cl. 315-326.000.

Sherman, Thomas E., to Preformed Line Products Company. Cable vibration dampener and method of installing. 4,620,059, Cl. 174-42.000.

Sherwin-Williams Company, The: *See*—
Druetzler, Thomas W., 4,619,955, Cl. 524-29.000.

Shibuya, Masato; and Uehara, Makoto, to Nippon Kogaku K. K. Illumination optical arrangement. 4,619,508, Cl. 353-122.000.
Shiga, Makoto; Miyazawa, Akira; and Miyutani, Mitsuyosi, to Daicel Chemical Industries Ltd. Tobacco smoke filter. 4,619,279, Cl. 131-345.000.
Shigematsu, Nana: *See*—
Tanaka, Tatsuo; and Shigematsu, Nana, 4,620,161, Cl. 330-257.000.
Shigematsu, Takashi; Tokoro, Setsuo; and Watanabe, Tomoyuki, to Toyota Jidosha Kabushiki Kaisha. Hydraulic pressure control apparatus for a continuously variable transmission. 4,619,629, Cl. 474-28.000.
Shimada, Yoshiaki: *See*—
Yoshimura, Shigeo; Shimada, Yoshiaki; and Kimura, Hitoshi, 4,619,147, Cl. 73-862.380.
Shimamura, Akira: *See*—
Abe, Kazuo; and Shimamura, Akira, 4,619,598, Cl. 425-131.100.
Shimano Industrial Company Limited: *See*—
Nagano, Masashi, 4,619,632, Cl. 474-80.000.
Nagano, Masashi, 4,619,633, Cl. 474-82.000.
Shimbashi, Henry. Dental articulator. 4,619,611, Cl. 433-55.000.
Shimizu, Isoo; Nomura, Hideki; Uchida, Kazumichi; and Mitsuyuki, Hitoshi, to Nippon Petrochemicals Co., Ltd. Method for producing aromatic hydrocarbons. 4,620,056, Cl. 585-452.000.
Shimizu, Osamu, to Sony Corporation. Tape loading apparatus for use in a recording and/or reproducing apparatus of the rotating head kind. 4,620,245, Cl. 360-85.000.
Shimoda, Hiromi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for preventing wear of heat transfer tubes in fluidized-bed boiler. 4,619,314, Cl. 165-104.160.
Shimura, Yukio: *See*—
Hato, Masakatsu; Shimura, Yukio; and Tsuda, Keishiro, 4,619,897, Cl. 435-182.000.
Shin-Etsu Chemical Co., Ltd: *See*—
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, 4,619,667, Cl. 8-444.000.
Shindo, Noboru: *See*—
Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, 4,619,685, Cl. 71-78.000.
Shinonaga, Hideo: *See*—
Doi, Toshiki; Shinonaga, Hideo; and Omae, Tadayuki, 4,619,969, Cl. 525-93.000.
Shiokawa, Kozo; Moriya, Koichi; Goto, Toshio; Kamochi, Atsumi; and Kohama, Shigeo, to Nihon Tokushu Noyaku Seizo K.K. Herbicidal sulfonylguanidine derivatives. 4,619,688, Cl. 71-92.000.
Shiraga, Jun: *See*—
Iwai, Shingo; Suzuki, Ryozo; Shiraga, Jun; and Okashiro, Tetsuo, 4,619,591, Cl. 417-422.000.
Shirian, Said, to Nynex Corporation. Duct for cable. 4,619,291, Cl. 138-109.000.
Shmakov, Edward: *See*—
Graville, Brian A.; and Shmakov, Edward, 4,620,082, Cl. 219-130.510.
Shoji, Hisataka; and Ouchi, Shigehiro, to Toray Industries, Inc. Radiation shielding composite sheet material. 4,619,963, Cl. 524-439.000.
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, to NSK-Warner K. K. One-way clutch. 4,619,352, Cl. 192-41.00A.
Shortridge, Douglas. Benzeneazo polynuclear aromatic or heteroaromatic amidine compounds containing amidine substituents. 4,619,994, Cl. 534-738.000.
Shure Brothers, Inc.: *See*—
Anderson, Carl R., 4,620,317, Cl. 381-90.000.
SI Handling Systems, Inc.: *See*—
Conklin, Barry C., 4,620,280, Cl. 364-426.000.
Lindquist, Per E., 4,619,204, Cl. 104-166.000.
Sickert, Armin: *See*—
Schafer, Walter; Hajek, Manfred; Muller, Hanns P.; Dhein, Rolf; Kuchenmeister, Rolf; and Sickert, Armin, 4,619,966, Cl. 524-589.000.
Sideman, Carl E.; Lewis, Thomas E.; and Nowak, Michael T., to Technographics Printworld, Inc. Sheet containing heat transferable dye and selective blocking agent for heat transfer printing. 4,619,665, Cl. 8-402.000.
Sidlof, Pavel: *See*—
Hrus, Miroslav; Svaty, Vladimir; Sidlof, Pavel; and Fisar, Oldrich, 4,619,296, Cl. 139-435.000.
Siebenga, Charles. Bale loading-stacking apparatus. 4,619,570, Cl. 414-39.000.
Siegel, Carole E.: *See*—
Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., 4,619,934, Cl. 514-277.000.
Siegel, Sanford A., to Dow Chemical Company, The. Monomeric plasticizers for halogen-containing resins. 4,620,026, Cl. 560-85.000.
Siemens Aktiengesellschaft: *See*—
Ahne, Hellmut; Kruger, Hans; and Rubner, Roland, 4,619,500, Cl. 350-341.000.
Gerber, Klaus, 4,619,499, Cl. 350-96.200.
Heinzl, Joachim; Penningsfeld, Hans-Dieter; and Berdelle-Hilge, Peter, 4,620,201, Cl. 346-140.00R.
Kappeler, Franz, 4,620,307, Cl. 372-50.000.
Kinzler, Hans, 4,620,165, Cl. 333-167.000.
Musil, Gerhard, 4,620,271, Cl. 363-21.000.
Paul, Bernt-Joachim; and Renz, Roman, 4,620,074, Cl. 200-144.00B.
Tschoepe, Norbert, 4,620,303, Cl. 371-16.000.
Weber, Walter; and Frank-Voeglein, Doris, 4,619,612, Cl. 433-80.000.
Siemon, Edward C., to Dana Corporation. Protection system for immunizing a controlled d-c power supply against a-c line voltage interruptions. 4,620,296, Cl. 363-51.000.
Sih, John C., to Upjohn Company, The. Substituted 2-pyridylmethylthio and sulfinyl-benzimidazoles as gastric antisecretory agents. 4,619,997, Cl. 544-124.000.
Simmons, Lacy W. Poultry processing apparatus. 4,619,017, Cl. 17-11.000.
Simone, Alexander J.: *See*—
Eigen, Edward; and Simone, Alexander J., 4,619,825, Cl. 424-49.000.
Simpson, Harold N. Threadably engaged locking mechanism. 4,619,122, Cl. 70-34.000.
Simpson, Sharon M.; McQuade, John M.; and Boon, John R., to Minnesota Mining and Manufacturing Company. Color photographic element containing three silver halide layers sensitive to infrared. 4,619,892, Cl. 430-505.000.
Singer, Stephen P., to Eastman Kodak Company. Photographic products employing nondiffusible N',N'-diaromatic carbocyclic—or diaromatic heterocyclic—sulfonohydrazide compounds capable of releasing photographically useful groups. 4,619,884, Cl. 430-223.000.
Singh, Balwant: *See*—
Raghu, Sivaraman; Hoffmann, Arthur K.; and Singh, Balwant, 4,620,009, Cl. 548-155.000.
Singh, Om P. Method and apparatus for treatment of fresh fractures, delayed unions and non-unions of living bone. 4,619,264, Cl. 128-419.00F.
Sircovich, Oscar. Method of erecting arched structures. 4,619,099, Cl. 52-745.000.
Sizer, Theodore, II; Duling, Irl N., III; Petras, Carl H.; and Letzring, Samuel A., to University of Rochester, The. Pockels cell driver. 4,620,113, Cl. 307-270.000.
Skarstad, Paul M.; and Hayes, Thomas G., to Medtronic, Inc. Electrochemical cells with end-of-life indicator. 4,619,874, Cl. 429-91.000.
Skeie, Halvor. Surface acoustic wave passive transponder having parallel acoustic wave paths. 4,620,191, Cl. 343-6.80R.
SKF Gmbh, Schweinfurt: *See*—
Haugwitz, Werner, 4,619,535, Cl. 384-472.000.
Skinner, Harry W.; Skinner, James W.; Skinner, William O.; and O'Donnell, William P., to Press-Seal Gasket Corporation. Slipline adjustable manhole seal. 4,619,555, Cl. 405-154.000.
Skinner, James W.: *See*—
Skinner, Harry W.; Skinner, James W.; Skinner, William O.; and O'Donnell, William P., 4,619,555, Cl. 405-154.000.
Skinner, William O.: *See*—
Skinner, Harry W.; Skinner, James W.; Skinner, William O.; and O'Donnell, William P., 4,619,555, Cl. 405-154.000.
Slachetka, Joseph P.: *See*—
Noorily, Peter; and Slachetka, Joseph P., 4,619,494, Cl. 339-103.00M.
Slack, Thomas B.: *See*—
Smith, Allen R.; Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,620,286, Cl. 364-513.000.
Slater Electric Inc.: *See*—
Rushansky, Yuliy, 4,620,071, Cl. 200-6.0BA.
Slegeir, William A.: *See*—
Sapienza, Richard S.; Slegeir, William A.; O'Hare, Thomas E.; and Mahajan, Devinder, 4,619,946, Cl. 518-700.000.
Sletzinger, Meyer; and Verhoeven, Thomas R., to Merck & Co., Inc. Process for the preparation of biphenyl intermediates. 4,620,025, Cl. 558-401.000.
Sloan, Donald R.: *See*—
Seyler, Gerard; and Sloan, Donald R., 4,619,328, Cl. 169-75.000.
Slonim, David M. Apparatus for recovering the energy of a moving fluid. 4,619,582, Cl. 416-8.000.
Slotboom, Jan W.: *See*—
Maas, Henricus G. R.; Slotboom, Jan W.; Appels, Johannes A.; and Osinski, Kazimierz, 4,619,039, Cl. 29-591.000.
Slusarek, Wojciech: *See*—
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,002, Cl. 544-318.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,006, Cl. 544-402.000.
Small, Maynard E. Bingo game involving promotional coupons. 4,619,457, Cl. 273-269.000.
Smedley, William H.: *See*—
Haber, Terry M.; and Smedley, William H., 4,619,245, Cl. 128-1.00R.
Smeed, Clement G.; and Browning, Shane C., to Gallaher Limited. Smoking rod wrapper. 4,619,278, Cl. 131-284.000.
Smiley, Christine L.: *See*—
Smiley, Thomas B.; and Smiley, Christine L., 4,619,766, Cl. 210-482.000.
Smiley, Thomas B.; and Smiley, Christine L. Beverage brewings filters, apparatus and method. 4,619,766, Cl. 210-482.000.
Smith, Allen R.; Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., to ITT Corporation. Probabilistic learning element. 4,620,286, Cl. 364-513.000.
Smith, Douglas A. Vertical bed portable cooking grill. 4,619,190, Cl. 99-393.000.
Smith, Eric G., to WABCO Ltd. Combined hydropneumatic brake cylinder/air reservoir device with automatic double-acting slack adjuster arrangement. 4,619,348, Cl. 188-351.000.
Smith, John S.: *See*—
Margalit, Shlomo; Chiu, Liew-Chuang; Smith, John S.; and Yariv, Amnon, 4,620,214, Cl. 357-63.000.

Smith, Kobert R., II, to BSR North America, Ltd. Information storage and retrieval system including a tape cartridge having a slidable cover. 4,620,254, Cl. 360-132.000.

Smith, Michael T., to Courier Display Systems Limited. Hinges. 4,619,304, Cl. 160-135.000.

Smith, Paul D.: *See—*
McDaniel, Max P.; and Smith, Paul D., 4,619,980, Cl. 526-96.000.

Smith, Peter H., to General Electric Company. Power control circuit for magnetron. 4,620,078, Cl. 219-10.55B.

Smith, Robert E.: *See—*
Kopfer, Rudolph J.; and Smith, Robert E., 4,619,651, Cl. 604-415.000.

Smith, Robert J. Heat transfer and conditioning unit. 4,619,242, Cl. 126-110.00R.

Smith, Ulf K. H.; and Lindstrom, Jan N., to Santrade Limited. Method of making a coated cemented carbide body and resulting body. 4,619,866, Cl. 428-336.000.

Smith, Verl V., Jr.: *See—*
Stahura, Daniel W.; and Smith, Verl V., Jr., 4,619,875, Cl. 429-143.000.

Smith, W. Novis, Jr., to Advanced Glass Systems, Inc. Ionomer resin films. 4,619,973, Cl. 525-329.900.

SmithKline Beckman Corporation: *See—*
Lam, Bing L.; and Pridgen, Lendon N., 4,620,001, Cl. 544-310.000.

Smits, Peter C. C., to Akzo NV. Process for the preparation of 2-keto-aldonic acids. 4,620,034, Cl. 562-531.000.

SMS Hasenclever Maschinenfabrik GmbH: *See—*
Endter, Horst; and Suther, Herbert, 4,619,574, Cl. 414-226.000.

Snitman, Bernard H. Articulating, self-supporting staircase. 4,619,084, Cl. 52-182.000.

Snyder, David E.; and Bruton, Billy R., to Axelson, Inc. Heat sensitive motor valve jack. 4,619,434, Cl. 251-14.000.

Snyder, Howard E., to Boeing Company, The. Variable camber vane and method therefor. 4,619,580, Cl. 415-12.000.

Sochor, Jerzy R. High-density press-fit cardedge connectors. 4,619,495, Cl. 339-176.0MP.

Societe Anonyme de Telecommunications: *See—*
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc A., 4,619,107, Cl. 57-6.000.

Societe Industrielle de Liaisons Electriques: *See—*
Missout, Bernard M.; Michaux, Jean-Pierre; and Piova, Jean-Luc A., 4,619,107, Cl. 57-6.000.

Societe Nationale Elf Aquitaine: *See—*
Hammou, Abdelkader; Rigaud, Philippe; and Rousseau, Catherine, 4,619,822, Cl. 423-592.000.

Societe Nationale Industrielle Aerospatiale: *See—*
Croiset, Pierre, 4,619,498, Cl. 350-6.600.
Delarue, Jean-Jacques; and Ego, Claude, 4,619,284, Cl. 137-67.000.

Soffa, Mark B.: *See—*
Amorosi, Vincent G.; Shah, Gautam N.; Soffa, Mark B.; Leonhardt, David A.; and Gillman, Gary L., 4,619,395, Cl. 228-4.500.

Sokolowski, Robert C.; and Johnson, Russell L., to Kimberly-Clark Corporation. Particulate paper product, especially for use as animal litter. 4,619,862, Cl. 428-221.000.

Soltysiak, Robert M.: *See—*
Bull, Robert W.; Soltysiak, Robert M.; and Minnick, Paul D., 4,619,827, Cl. 424-89.000.

Someya, Noboru, to Tokyo Rika Kikai Co., Ltd. Fluid passage connector for liquid chromatograph. 4,619,473, Cl. 285-353.000.

Songer, Jimmie D., to High Resolution Television, Inc. Standard transmission and recording of high resolution television. 4,620,217, Cl. 358-12.000.

Sony Corporation: *See—*
Amano, Toshio; Fujioka, Yoshihisa; Nagai, Kunio; and Oda, Osamu, 4,620,229, Cl. 358-194.100.
Ogawa, Hiroshi, 4,620,300, Cl. 369-33.000.
Shimizu, Osamu, 4,620,245, Cl. 360-85.000.
Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, 4,619,730, Cl. 156-617.0SP.
Takahashi, Kozoh, 4,620,242, Cl. 360-74.100.
Yamashita, Noriyuki, 4,620,312, Cl. 375-22.000.

Southern Pacific Land Co.: *See—*
Gritters, Gregory A.; and Perez, Jose M., 4,619,769, Cl. 210-747.000.

Soworowski, David R.: *See—*
Balzer, Norbert R.; and Soworowski, David R., 4,619,717, Cl. 148-112.000.

Spath, Martin-Willi: *See—*
Angrick, Michael; and Spath, Martin-Willi, 4,619,701, Cl. 106-38.230.

Spector, George: *See—*
Hill, Charles; and Spector, George, 4,619,063, Cl. 42-7.000.
McDonald, Edith N.; and Spector, George, 4,619,622, Cl. 441-111.000.

Spencer, Dudley W. C., to Du Pont de Nemours, E. I., and Company. Sterile, cold cut connection process, apparatus and system. 4,619,642, Cl. 604-29.000.

Sperry Corporation: *See—*
Ellsworth, James G.; and Wulling, Thomas E., 4,620,278, Cl. 364-200.000.

Spiger, Robert J., to Boeing Company, The. Display system. 4,620,230, Cl. 358-201.000.

Spill, Horst. Cover for a seatbelt of an automobile. 4,619,468, Cl. 280-801.000.

Spinosa, Dominic J.; and Knoll, Frank, to East/West Industries, Inc. Oxygen supply system. 4,619,255, Cl. 128-202.270.

Spivack, John D.: *See—*
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,619,957, Cl. 524-91.000.

Sprankle, David A.: *See—*
Karr, Dennis K.; and Sprankle, David A., 4,620,175, Cl. 337-343.000.

Sprayrite Manufacturing Co., Inc.: *See—*
Hardman, Dale G., 4,619,401, Cl. 239-214.170.

Sprecker, Mark A.: *See—*
Wiegers, Wilhelmus J.; Sprecker, Mark A.; and Schreiber, William L., 4,619,781, Cl. 252-522.00R.

Springs Industries, Inc.: *See—*
Hendrix, James E.; Daniels, John Y.; and Jackson, Bobby D., 4,619,864, Cl. 428-240.000.

Spry, Larry W.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Squires, David G.; Hundley, Lloyd; and Barry, Raymond A., to Texo Corporation. Method for stripping organic coatings from substrates. 4,619,706, Cl. 134-2.000.

Stahura, Daniel W.; and Smith, Verl V., Jr., to General Motors Corporation. Anti-stratification battery separator. 4,619,875, Cl. 429-143.000.

Stall, Joe C.; Andrews, Steven L.; and Curnutt, Donald D., to Standard Oil Company (Indiana). Technique for increased retention time in oil field settling tanks. 4,619,771, Cl. 210-788.000.

Stambaugh, Edgel P.; Adair, James H.; Sekercioglu, Ibrahim; and Wills, Roger R., to Battelle Memorial Institute. Hydrothermal method for producing stabilized zirconia. 4,619,817, Cl. 423-266.000.

Stampfli, Armin: *See—*
Vogel, Ernst; Berger, Fritz; and Stampfli, Armin, 4,619,497, Cl. 339-244.00R.

Standard Oil Company (Indiana): *See—*
Schmidt, Gregory E.; Leung, Linus K.; Beck, Lawrence J.; and Chang, David S., 4,620,049, Cl. 585-501.000.
Stall, Joe C.; Andrews, Steven L.; and Curnutt, Donald D., 4,619,771, Cl. 210-788.000.

Standard Oil Company, now Amoco Corporation: *See—*
Read, Randol R.; Cox, Everett L.; and Selzler, Randall L., 4,620,279, Cl. 364-200.000.

Standard Products Company, The: *See—*
Jackson, Norman C., 4,619,847, Cl. 428-31.000.

Stanley Electric Co., Ltd.: *See—*
Oyama, Hiroo, 4,620,269, Cl. 362-80.000.

Stanley Works, The: *See—*
Czopor, Edmund J., Jr., 4,619,364, Cl. 206-379.000.
Lecher, Bernard G., Sr., 4,619,020, Cl. 24-10.00A.

Stapelmann, Rolf: *See—*
Kautz, Ralf-Dieter; and Stapelmann, Rolf, 4,619,133, Cl. 73-1.00R.

Starzewski, Karl-Heinz A. O.; Witte, Josef; and Bartl, Herbert, to Bayer Aktiengesellschaft. Organic nickel compounds, production and use thereof as catalysts in the polymerization of olefins. 4,620,021, Cl. 556-19.000.

State of Israel Ministry of Defense, Military Industries, The: *See—*
Shalev, Ilan, 4,619,184, Cl. 89-185.000.

Stauffer Chemical Company: *See—*
Cheng, Chung-Ping; Iacobucci, Paul A.; and Walsh, Edward N., 4,619,908, Cl. 502-214.000.

STC plc: *See—*
Chown, David P. M., 4,620,321, Cl. 455-619.000.

Stein, Alejandro. Building structure. 4,619,089, Cl. 52-233.000.

Steiner, Gerd: *See—*
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.

Steltenkamp, Robert J.; and Camara, Michael A., to Colgate-Palmolive Company. Antistatic agents which are multiamides of trialkylacetic acids and multiamines. 4,619,775, Cl. 252-8.800.

Stephano & Co., Ltd.: *See—*
Sato, Masami, 4,619,054, Cl. 34-92.000.

Sticht, Walter, to STIWA-Fertigungstechnik Sticht GesmbH. Conveyor arrangement. 4,619,205, Cl. 104-168.000.

Stiefel, Frank J., to Carter-Wallace, Inc. Synthesis of β-((2-methylpropoxy)methyl)-N-phenyl-N-(phenylmethyl)-1-pyrrolidineethanamine. 4,620,015, Cl. 548-547.000.

STIWA-Fertigungstechnik Sticht GesmbH: *See—*
Sticht, Walter, 4,619,205, Cl. 104-168.000.

Stokbroekx, Raymond A.: *See—*
Heeres, Jan; Stokbroekx, Raymond A.; and Backx, Leo J. J., 4,619,931, Cl. 514-252.000.

Stolar, Mike; Robertson, David B.; and Cichy, Mitchell J., to Safe-T-Stop Inc. System for remote disabling of an internal combustion engine. 4,619,231, Cl. 123-333.000.

Stolz, Yves. Miniature firearm. 4,619,064, Cl. 42-69.010.

Stone, Robbie L.: *See—*
Frick, John G., Jr.; Jones, Brian W.; Stone, Robbie L.; and Watson, Michael D., 4,619,668, Cl. 8-496.000.

Stone, Robert L.: *See*—
Goor, Dan; Niles, Everett; and Stone, Robert L., 4,619,872, Cl. 428-632.000.

Stone, Walter H.: *See*—
Church, John F.; Stone, Walter H.; and Schaupp, Richard E., 4,619,764, Cl. 210-248.000.

Stopinc Aktiengesellschaft: *See*—
Bachmann, Herbert; and Hornung, Karl-Otto, 4,619,444, Cl. 266-236.000.

Storm, Joe. Wind turbine apparatus. 4,619,585, Cl. 416-132.00B.

Strada, Pier E.: *See*—
Magnoni, Pierangelo; Strada, Pier E.; Cavagnis, Walter; and Sanvito, Angelo, 4,619,006, Cl. 5-68.000.

Strickland, Richard C. Double tailed fish bait. 4,619,069, Cl. 43-42.260.

Stringfellow, Dale A.; and Fast, Patricia E., to Upjohn Company, The. 6-aryl pyrimidines for treating aplastic anemia. 4,619,933, Cl. 514-272.000.

Strobel, Charles W.: *See*—
Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., 4,619,051, Cl. 34-9.000.

Stromdahl, Carl Å.: *See*—
Juan, Hans; Bjerngren, Jan Å.; and Stromdahl, Carl Å., 4,619,551, Cl. 404-90.000.

Strop, Hans R.; and Perry, Richard R. Pretreatment process for rendering. 4,619,789, Cl. 260-412.600.

Stucki, Samuel: *See*—
Christen, Hans-Jorg; Devantay, Hubert; Schellenberg, Claude; Scherer, Gunther; and Stucki, Samuel, 4,619,753, Cl. 204-290.00F.

Subramaniam, A. Ram: *See*—
Lee, Gil S.; and Subramaniam, A. Ram, 4,620,115, Cl. 307-443.000.

Sudrabin, David A., to Fibrestone Incorporated. Method of forming a composite wall for a building structure. 4,619,032, Cl. 29-460.000.

Suenaga, Makoto; Yano, Mitsuru; Ishihara, Yasuoki; and Ohtsuka, Kohki, to Hitachi Metals, Ltd. Method of producing nodular graphite cast iron. 4,619,713, Cl. 148-3.000.

Sugano, Akira: *See*—
Takita, Atsushi; Sugano, Akira; and Honda, Naganobu, 4,619,224, Cl. 122-451.00R.

Sugazaki, Kazuo: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.

Sughrue, Edward L.: *See*—
Myers, John W.; Parrott, Stephen L.; and Sughrue, Edward L., 4,619,759, Cl. 208-210.000.

Sugihara, Tadashi: *See*—
Hijikata, Kenichi; Sugihara, Tadashi; and Komabayashi, Masashi, 4,619,697, Cl. 75-230.000.

Sugita, Shoji: *See*—
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.

Sugiura, Haruyuki: *See*—
Matsui, Kazuhiro; and Sugiura, Haruyuki, 4,619,431, Cl. 248-500.000.

Sugiyama, Shizuo: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.

Suhr, Ludwig: *See*—
Ruff, Klemens; Suhr, Ludwig; and Paikert, Paul, 4,619,671, Cl. 55-222.000.

Sullivan, Brian, to KCL Corporation. Substantially leakproof zipper closure for bags and method. 4,620,320, Cl. 383-79.000.

Sumitani, Shigeto, to Kabushiki Kaisha Toshiba. Pulse combustor. 4,619,601, Cl. 431-1.000.

Sumitomo Chemical Company, Limited: *See*—
Doi, Toshiki; Shinonaga, Hideo; and Omae, Tadayuki, 4,619,969, Cl. 525-93.000.
Haga, Toru; Nagano, Eiki; Sato, Ryo; and Morita, Kouichi, 4,619,687, Cl. 71-92.000.
Hashimoto, Tadanori; Yoshitake, Hiroshi; Hata, Shigenao; and Nakazono, Akiko, 4,619,704, Cl. 106-286.400.

Sumitomo Electric Industries, Ltd.: *See*—
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, 4,619,247, Cl. 128-6.000.

Sumitomo Heavy Industries, Ltd.: *See*—
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, 4,619,310, Cl. 164-448.000.

Sumitomo Metal Industries, Ltd.: *See*—
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, 4,619,310, Cl. 164-448.000.

Summa, Gareth D.; Reed, George K.; and Burt, Harold S., to Mid-West Conveyor Company, Inc. Apparatus for storage and retrieval of thin trays and sheets. 4,619,575, Cl. 414-280.000.

Sun Refining and Marketing Company: *See*—
Hsu, Chao-Yang, 4,620,027, Cl. 560-104.000.

Sundberg, Bo; and Jonason, Hans, to HB Autonom. Animal training course, especially for race horses. 4,619,222, Cl. 119-15.50R.

Sundstrand Corporation: *See*—
Weber, Kent, 4,619,115, Cl. 62-217.000.

Sunshine, Abraham; Laska, Eugene M.; and Siegel, Carole E., to Analgesic Associates. Cough/cold mixtures comprising non-steroidal anti-inflammatory drugs. 4,619,934, Cl. 514-277.000.

Susi, Peter V., to American Cyanamid Co. Stabilization of high solids coatings with synergistic combinations. 4,619,956, Cl. 524-87.000.

Suther, Herbert: *See*—
Endter, Horst; and Suther, Herbert, 4,619,574, Cl. 414-226.000.

Sutker, Burton J.; Hussain, Saadat; and Mossaad, Amgad S., to Ethyl Corporation. Halogenated polyphenyl sulfide or sulfide/ether compounds. 4,619,961, Cl. 524-393.000.

Sutter, Leroy V., Jr. Elongated chambers for use in combination with a transversely excited gas laser. 4,620,306, Cl. 372-38.000.

Suwabe, Yasushi: *See*—
Takahashi, Keiko; Suwabe, Yasushi; and Wakabayashi, Toshio, 4,619,938, Cl. 514-356.000.

Suzaki, Masayuki; Hirota, Tetsuro; Kanno, Tetsuo; and Koguchi, Takeziro, to Ricoh Company, Ltd. Apparatus for driving a floppy disc. 4,620,249, Cl. 360-99.000.

Suzuki, Fumio: *See*—
Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, 4,619,685, Cl. 71-78.000.

Suzuki, Haruo: *See*—
Mori, Kohei; and Suzuki, Haruo, 4,619,185, Cl. 91-369.00R.

Suzuki, Kazuhiro, to Nippon Cable System, Inc. Transmission operating device. 4,619,152, Cl. 74-473.00R.

Suzuki, Kenichi; and Miura, Fusayoshi, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Method of brazing an aluminum material. 4,619,716, Cl. 148-26.000.

Suzuki, Ryozo: *See*—
Iwai, Shingo; Suzuki, Ryozo; Shiraga, Jun; and Okashiro, Tetsuo, 4,619,591, Cl. 417-422.000.

Suzuki, Shigeo: *See*—
Kakuta, Atsushi; Oka, Hiroyuki; Suzuki, Shigeo; Araya, Kotaro; Mori, Yasuki; and Morishita, Hirosada, 4,619,879, Cl. 430-58.000.

Suzuki, Shoji: *See*—
Uesugi, Naomoto; and Suzuki, Shoji, 4,619,344, Cl. 181-229.000.

Suzuki, Toshihiko; Isawa, Nobuyuki; Ohkubo, Yasunori; and Hoshi, Kinji, to Sony Corporation. Process for solidification in a magnetic field with a D.C. heater. 4,619,730, Cl. 156-617.0SP.

Suzuki, Yoshiaki, to Toko Kogyo Kabushiki Kaisha. Apparatus for assembling cable drum. 4,619,026, Cl. 29-256.000.

Suzuki, Yoshihisa; Yasui, Yoshiharu; and Seiki, Kazuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for yarn piecing in a fasciated yarn spinning unit. 4,619,109, Cl. 57-261.000.

Svaty, Vladimir: *See*—
Hrus, Miroslav; Svaty, Vladimir; Sidlof, Pavel; and Fisar, Oldrich, 4,619,296, Cl. 139-435.000.

Swanson, John L. Snowblower. 4,619,061, Cl. 37-248.000.

Swanson, Lynos. Sweep auger. 4,619,577, Cl. 414-312.000.

Swiss Aluminium Ltd.: *See*—
Bessard, Jean-Claude, deceased, 4,619,750, Cl. 204-243.00R.
Huber, Ernst; Rieger, Wolfhart; and Bolliger, Martin, 4,619,309, Cl. 164-430.000.

Sydow, Michael E.: *See*—
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Sylvest, Lawrence E., II, to Conoco Inc. Drum lifting apparatus. 4,619,475, Cl. 294-90.000.

Syncare, Inc.: *See*—
Taylor, James, 4,619,262, Cl. 128-334.00R.

Synofzik, Reinhard: *See*—
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,201, Cl. 102-283.000.
Romer, Rudolf; Schwenzer, Michael; and Synofzik, Reinhard, 4,619,202, Cl. 102-443.000.

Szebeni, Rudolf: *See*—
Balkanyi, Ivan; Szebeni, Rudolf; Hadi, Ferenc; Marso , Miklos; Keri, Eva; and Koszegi, Bela, 4,619,936, Cl. 514-282.000.

Szemeredi, Robert S.: *See*—
La Belle, John T.; Szemeredi, Robert S.; and Tarnay, Matthew G., 4,620,075, Cl. 200-159.00B.

Szent-Gyorgyi, Albert; and Fodor, Gabor B., to National Foundation for Cancer Research. 2-furylbutyrolactones and methods for using same. 4,620,014, Cl. 548-545.000.

Szmuk, Szilvia; Kirouac, J. Paul; and Feist, Betsy. Multi-pocket envelope for floppy discs. 4,619,399, Cl. 229-72.000.

Tabarelli, Werner; and Lobach, Ernst, to Perkin-Elmer Censor Anstalt. Device for the projection copying of masks. 4,619,524, Cl. 355-53.000.

Tachibana, Hajime: *See*—
Yamana, Keiichi; Tachibana, Hajime; and Ohtsuka, Shuichi, 4,619,513, Cl. 355-3.0CH.

Taga Electric Company, Limited: *See*—
Mishiro, Shoji, 4,620,121, Cl. 310-323.000.

Taguchi, Shinji; Matsumura, Homare; and Maeguchi, Kenji, to Kabushiki Kaisha Toshiba. Method of manufacturing a semiconductor device. 4,619,037, Cl. 29-578.000.

Taguchi, Yoshinobu: *See*—
Takahashi, Tetsuo; Taguchi, Yoshinobu; and Saito, Kenichi, 4,619,043, Cl. 29-840.000.

Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, to Nippon Oil Company, Limited. Process for preparing polyolefins. 4,619,981, Cl. 526-125.000.

Takagi, Sadaaki. Method for preformation of cushion and apparatus therefor. 4,619,723, Cl. 156-62.200.

Takagi, Yoshihiro; and Adachi, Keiichi, to Fuji Photo Film Co., Ltd. Light-sensitive material for silver salt diffusion transfer process with antihalation dye. 4,619,893, Cl. 430-519.000.

Takahashi, Keiko; Suwabe, Yasushi; and Wakabayashi, Toshio, to Terumo Kabushiki Kaisha. Fatty acid derivatives of aminoalkyl nicotinic acid esters and platelet aggregation inhibitors. 4,619,938, Cl. 514-356.000.

Takahashi, Kozoh, to Sony Corporation. Apparatus for controlling a reversible tape drive in a magnetic tape player. 4,620,242, Cl. 360-74.100.

Takahashi, Masaharu: *See*—
Sano, Toshio; Takahashi, Masaharu; Murakoshi, Yoichi; and Matsuno, Kenichi, 4,619,127, Cl. 72-56.000.

Takahashi, Michihiko; Saito, Eiichi; Okano, Takeshi; and Nakaoka, Sadaaki, to Fuji Photo Film Co., Ltd. Electrophotographic camera processor-reader. 4,619,519, Cl. 355-11.000.

Takahashi, Osamu, to Fuji Photo Film Co., Ltd. Photosensitive material with particles of hydroquinone and polymer. 4,619,891, Cl. 430-505.000.

Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, to Hitachi, Ltd. Method of removing crude oil sludge. 4,619,768, Cl. 210-739.000.

Takahashi, Tetsuo; Taguchi, Yoshinobu; and Saito, Kenichi, to TDK Corporation. Apparatus and method for mounting chip type electronic parts. 4,619,043, Cl. 29-840.000.

Takai, Kiyoshi; and Iwasaki, Kiyoshi, to Godo Steel, Ltd. System using electric furnace exhaust gas to preheat scrap for steelmaking. 4,619,693, Cl. 266-88.000.

Takakusagi, Tsunehiko: *See*—
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.

Takami, Masato, to Fukuda Metal Foil & Powder Co., Ltd. Copper foil for printed circuit board. 4,619,871, Cl. 428-607.000.

Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, to Victor Company of Japan, Limited. Color imaging apparatus with compensation for beam deflection nonlinearity. 4,620,221, Cl. 358-47.000.

Takatoshi, Koitabashi, to Sanden Corporation. Engagement device for an electromagnetic spring-wound clutch. 4,619,351, Cl. 192-35.000.

Takeda Chemical Industries, Ltd.: *See*—
Taniguchi, Shin ichi; and Ohtsuki, Takashi, 4,619,360, Cl. 198-471.100.

Takeda Riken Co., Ltd.: *See*—
Niki, Shoji, 4,620,147, Cl. 324-77.00A.

Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; and Harada, Shigeo, to Fuji Photo Film Co., Ltd. Thermal developing and transferring method. 4,620,096, Cl. 250-319.000.

Takemoto, Takeshi, to Ricoh Company, Ltd. Printing hammer assembly. 4,619,536, Cl. 400-157.200.

Takenaka, Takaji: *See*—
Nakayama, Wataru; Nakajima, Tadakatsu; Hirasawa, Shigeki; Kohno, Akiomi; and Takenaka, Takaji, 4,619,316, Cl. 165-104.330.

Takeshima, Sadao: *See*—
Higashi, Katsumi; and Takeshima, Sadao, 4,619,338, Cl. 180-142.000.

Takita, Atsushi; Sugano, Akira; and Honda, Naganobu, to Hitachi, Ltd. Apparatus for controlling drum water level of drum type boiler. 4,619,224, Cl. 122-451.00R.

Tan, Chuan-Chieh: *See*—
Smith, Allen R.; Tan, Chuan-Chieh; Slack, Thomas B.; and Denenberg, Jeffrey N., 4,620,286, Cl. 364-513.000.

Tanaka, Fumio: *See*—
Iuchi, Tohru; and Tanaka, Fumio, 4,619,529, Cl. 356-358.000.

Tanaka, Hiroshi; Adachi, Yuuma; and Nakajima, Nobuyoshi, to Fuji Photo Film Co., Ltd. Method of adjusting scale factor for radiation image. 4,620,097, Cl. 250-327.200.

Tanaka, Seiichi; and Nagano, Fumikazu, to Sharp Kabushiki Kaisha. Image picture reading device. 4,620,236, Cl. 358-293.000.

Tanaka, Takashi; and Hayashi, Kenro, to Toshiba Ceramics Co., Ltd. Method of manufacturing parts for use to the heat processing furnace. 4,619,798, Cl. 264-62.000.

Tanaka, Tatsuo; and Shigematsu, Nana, to Kabushiki Kaisha Toshiba; and Toshiba Audio Video Engineering Co., Inc. Composite transistor circuit. 4,620,161, Cl. 330-257.000.

Tanaka, Yoko: *See*—
DeLuca, Hector F.; Ikekawa, Nobuo; Kobayashi, Yoshiro; and Tanaka, Yoko, 4,619,920, Cl. 514-167.000.

Tanaka, Yoshinari: *See*—
Anzawa, Haruyoshi; Satoh, Kenji; Tanaka, Yoshinari; and Okaya, Takuji, 4,619,849, Cl. 428-35.000.

Tandy Corporation: *See*—
Cook, Randall W.; Rozporka, Richard E.; and Jones, Robert S., 4,620,255, Cl. 360-132.000.

Tani, Zempei; Ebina, Kiyoshi; Ichikawa, Osamu; and Imaizumi, Mamoru, to Sharp Kabushiki Kaisha; and Brother Industries, Ltd. Photoelectric encoder. 4,620,094, Cl. 250-231.05E.

Taniguchi, Shin ichi; and Ohtsuki, Takashi, to Takeda Chemical Industries, Ltd. Product transporting apparatus. 4,619,360, Cl. 198-471.100.

Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, to Babcock-Hitachi Kabushiki Kaisha. Process for producing methyl ethyl ketone. 4,620,038, Cl. 568-401.000.

Tarnay, Matthew G.: *See*—
La Belle, John T.; Szemeredi, Robert S.; and Tarnay, Matthew G., 4,620,075, Cl. 200-159.00B.

Tarulli, Gerald. Support and tethered amusement device. 4,619,626, Cl. 446-228.000.

Tateishi, Mataji: *See*—
Imoto, Koji; Tateishi, Mataji; Inenaga, Noriyasu; Omura, Tadao; Ishikawa, Hideyuki; Harada, Sumio; Kiyota, Yuhiko; Kobayashi, Hiroyuki; Nakanishi, Koichi; and Kume, Satoru, 4,619,229, Cl. 123-286.000.

Tatin, Gerard, to Atochem. Process for the bleaching of textiles and stabilizing composition therefor. 4,619,663, Cl. 8-107.000.

Tatsumi, Hisao; Kayata, Haruhiko; and Watanabe, Fumio, to Kabuskiki Kaisha Toshiba. Thermal transfer color printer. 4,620,199, Cl. 346-76.0PH.

Taylor, Hylton, to Pilkington P.E. Limited. Solar cell assembly. 4,619,863, Cl. 428-221.000.

Taylor, James, to Syncare, Inc. Surgical stapling device. 4,619,262, Cl. 128-334.00R.

Taylor, Lawrence H. Metallic structural member particularly for support of walls and floors of buildings. 4,619,098, Cl. 52-738.000.

Taylor, Patrick R.; and Omofoma, Matthew A., to Idaho Research Foundation, Inc. Chromite ore beneficiation. 4,619,690, Cl. 75-1.00R.

TDK Corporation: *See*—
Nakayama, Masatoshi; Morita, Haruyuki; and Kubota, Yuichi, 4,619,861, Cl. 428-220.000.
Takahashi, Tetsuo; Taguchi, Yoshinobu; and Saito, Kenichi, 4,619,043, Cl. 29-840.000.

Technicare Corporation: *See*—
Erker, Joseph W., 4,620,313, Cl. 378-19.000.

Technicon Instruments Corp.: *See*—
Cohen, Beri, 4,619,795, Cl. 264-4.600.

Technika Beteiligungsgesellschaft mbH: *See*—
Dammann, Karl-Heinz, 4,619,596, Cl. 418-201.000.

Technographics Printworld, Inc.: *See*—
Sideman, Carl E.; Lewis, Thomas E.; and Nowak, Michael T., 4,619,665, Cl. 8-402.000.

Teder, Rein S.: *See*—
McCumber, Roger D.; and Teder, Rein S., 4,620,141, Cl. 318-483.000.

Teerling, Wolfgang, to Windmoller & Holscher. Process of making sheet material comprising a substrate web of synthetic thermoplastic material and an adhesive layer consisting of a non-crosslinkable elastomer. 4,619,799, Cl. 264-101.000.

Teetz, Volker: *See*—
Henning, Rainer; Urbach, Hansjorg; Teetz, Volker; and Becker, Reinhard, 4,620,012, Cl. 548-411.000.

Tegal Corporation: *See*—
Rathmann, Thomas M.; Drake, Herbert G.; Mirkovich, Ninko T.; and Lachenbruch, Roger B., 4,619,573, Cl. 414-222.000.

Teijin Limited: *See*—
Kiriyama, Tsutomu; Horie, Shigeru; Ichihashi, Tetsuo; and Oshida, Masahiro, 4,619,869, Cl. 428-480.000.
Saiki, Noritsugu; and Konishi, Tadashi, 4,619,987, Cl. 528-274.000.

Temple, Victor A. K.: *See*—
Baliga, Bantval J.; Temple, Victor A. K.; and Chow, Tat-Sing P., 4,620,211, Cl. 357-38.000.

Tennessee Valley Authority: *See*—
Salladay, David G.; and Achorn, Frank P., 4,619,684, Cl. 71-34.000.

Teodorescu, Tonel E.; and Banko, William, to Banko, William; Allen, Henry E.; and Shamos, Morris H. Flow meter. 4,619,146, Cl. 73-861.540.

Teraoka, Fuminori; Matsui, Takeo; and Mori, Shinji, to Kabushiki Kaisha Tokai-Rika-Denki-Seisakusho. Acceleration sensor. 4,619,417, Cl. 242-107.40A.

Terrell, Jamie B.; and Pratt, Donna K., to Gearhart Industries, Inc. Chemical cutting method and apparatus. 4,619,318, Cl. 166-55.000.

Terry, Bill C.: *See*—
Hanker, Jacob S.; Terry, Bill C.; Ambrose, Wallace W.; and Lupton, Cecel R., 4,619,655, Cl. 623-1.000.

Terui, Sadao: *See*—
Ono, Tetsuji; Ichihara, Shoichi; Ohta, Tomohisa; and Terui, Sadao, 4,619,909, Cl. 502-303.000.

Terumo Kabushiki Kaisha: *See*—
Takahashi, Keiko; Suwabe, Yasushi; and Wakabayashi, Toshio, 4,619,938, Cl. 514-356.000.

Teschendorf, Hans-Jurgen: *See*—
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, 4,619,929, Cl. 514-252.000.

Tetaz, Roger; and Vizet, Philippe, to Saint-Gobain Recherche. Method and apparatus for measurement of stress in float glass. 4,619,681, Cl. 65-29.000.

Tetenbaum, Marvin T.: *See*—
Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., 4,619,952, Cl. 523-409.000.
Tetra Pak International AB: *See*—
Nedstedt, Ulf, 4,620,184, Cl. 340-675.000.
Texaco Inc.: *See*—
Cook, Ronald L., 4,619,743, Cl. 204-77.000.
Pratt, Roy E.; Sayles, Scott M.; Bowers, Kerry W.; and Scott, Richard P., deceased, 4,619,758, Cl. 208-85.000.
Texas Instruments Incorporated: *See*—
Chauvel, Gerard, 4,620,289, Cl. 364-521.000.
Havemann, Robert H.; and Baber, Samuel C., 4,619,036, Cl. 29-577.00C.
Hooper, Robert C.; Verret, Douglas P.; and Roane, Bobby A., 4,619,887, Cl. 430-313.000.
Houston, Theodore W., 4,620,297, Cl. 365-174.000.
Parker, Sidney G.; and York, Rudy L., 4,620,209, Cl. 357-30.000.
Texas United Chemical Corp.: *See*—
Mondshine, Thomas C., 4,619,776, Cl. 252-8.551.
Texo Corporation: *See*—
Squires, David G.; Hundley, Lloyd; and Barry, Raymond A., 4,619,706, Cl. 134-2.000.
Textron Inc.: *See*—
Liu, Li-Hsiung, 4,619,228, Cl. 123-182.000.
Thermco Systems, Inc.: *See*—
Goldman, Jon C.; Fisk, Michael A.; and Diem, Michael, 4,619,840, Cl. 427-91.000.
Thevenin, Patrick D.; Gissinger, Bernard C.; and Thevenin, Stephane J. Fencing device, a stake, a fastener and an assembly part for such a device. 4,619,440, Cl. 256-47.000.
Thevenin, Stephane J.: *See*—
Thevenin, Patrick D.; Gissinger, Bernard C.; and Thevenin, Stephane J., 4,619,440, Cl. 256-47.000.
Thiel, Gerhard: *See*—
Quittkat, Jorg; Thiel, Gerhard: and Ursula, Ruth, 4,620,162, Cl. 331-45.000.
Thieme, Peter C.; Steiner, Gerd; Rohr, Wolfgang; Lenke, Dieter; Gries, Josef; Weifenbach, Harald; Teschendorf, Hans-Jurgen; Hofmann, Hans P.; and Kreiskott, Horst, to BASF Aktiengesellschaft. Phenylpiperazine derivatives of hetarylphenols and hetarylanilines, their preparation, and therapeutic agents containing these compounds. 4,619,929, Cl. 514-252.000.
Thomas & Betts Corporation: *See*—
Brush, Robert W., Jr., 4,619,487, Cl. 339-14.00R.
Noorily, Peter; and Slachetka, Joseph P., 4,619,494, Cl. 339-103.00M.
Thomas, Gareth; Ahn, Jae-Hwan; and Kim, Nack-Joon, to University of California, The Regents of the. Controlled rolling process for dual phase steels and application to rod, wire, sheet and other shapes. 4,619,714, Cl. 148-12.00B.
Thomas, Ian M.; and Tillman, James J., to Owens-Illinois, Inc. Process for forming a doped oxide film and composite article. 4,619,719, Cl. 148-188.000.
Thomas, John S., Jr., to Paramount Packaging Corporation. Bag for displaying food. 4,619,361, Cl. 206-204.000.
Thomas, Ralph H., Sr.: *See*—
Agbay, Albert J.; and Thomas, Ralph H., Sr., 4,619,370, Cl. 215-225.000.
Thomason, William H.: *See*—
Salama, Mamdouh M.; Myers, Roderick J.; Thomason, William H.; and Joosten, Michael H., 4,619,557, Cl. 405-211.000.
Thompson, David A.: *See*—
Garwin, Richard L.; and Thompson, David A., 4,620,253, Cl. 360-107.000.
Thompson, Robert A.; and Breuning, Richard W., to General Electric Company. In-process cutting tool condition compensation and part inspection. 4,620,281, Cl. 364-475.000.
Thomson-CSF: *See*—
Arnould, Jacques; and Tonnel, Eugene, 4,620,213, Cl. 357-55.000.
Delestre, Xavier; and Sauvage, Marc, 4,620,168, Cl. 333-202.000.
Thornton, James P., to Fairchild Weston Systems, Inc. Apparatus and method for controlling electromagnetic clutches and the like. 4,620,261, Cl. 361-154.000.
Thornton, Paul A.: *See*—
Houlbrook, Kenneth; and Thornton, Paul A., 4,619,382, Cl. 222-327.000.
Thwaites, Geoffrey R.: *See*—
Knight, John R.; and Thwaites, Geoffrey R., 4,619,848, Cl. 428-35.000.
Tideland Signal Corporation: *See*—
Tigwell, David C.; and Recane, Marion L., 4,620,190, Cl. 340-985.000.
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., to University of North Carolina. Inhibition of Respiratory Syncytial virus-induced cell fusion by amidino compounds. 4,619,942, Cl. 514-415.000.
Tigwell, David C.; and Recane, Marion L., to Tideland Signal Corporation. Method and apparatus for simultaneously actuating navigational lanterns. 4,620,190, Cl. 340-985.000.
Tikkurilan Varitehtaat Oy: *See*—
Penttinen, Kyosti, 4,619,854, Cl. 428-99.000.
Tillman, James J.: *See*—
Thomas, Ian M.; and Tillman, James J., 4,619,719, Cl. 148-188.000.
Timby, Ernest A.: *See*—
Lewis, Geoffrey A.; Timby, Ernest A.; and Walsh, Rodney H., 4,619,581, Cl. 415-143.000.
Timm, Gerald W.: *See*—
Helms, Richard A.; Timm, Gerald W.; and Sandford, Donald L., 4,619,251, Cl. 128-79.000.
Tisue, J. Gilbert, to Fuji Photo Film Co., Ltd. Reset circuit for MOS imager array. 4,620,232, Cl. 358-213.000.
Titan Manufacturing Co. Pty. Ltd., The: *See*—
Norris, Colin, 4,619,559, Cl. 405-259.000.
Toa Nenryo Kogyo Kabushiki Kaisha: *See*—
Inoue, Hiroshi; Miyazaki, Makoto; Isoi, Masaaki; and Yoda, Makoto, 4,619,972, Cl. 525-193.000.
Todd, Leonard M. Ring signal detector. 4,620,063, Cl. 179-2.00A.
Todorov, Todor S.: *See*—
Petkov, Georgi K.; Todorov, Todor S.; Atanassova, Yordanka R.; Netzov, Nikola M.; Deevski, Stefan K.; Radev, Nikola I.; Botev, Botyo P.; Metev, Georgi M.; Naydenov, Ivan H.; and Petrov, Yakim N., 4,619,129, Cl. 72-56.000.
Toko Kogyo Kabushiki Kaisha: *See*—
Suzuki, Yoshiaki, 4,619,026, Cl. 29-256.000.
Tokoro, Setsuo: *See*—
Shigematsu, Takashi; Tokoro, Setsuo; and Watanabe, Tomoyuki, 4,619,629, Cl. 474-28.000.
Tokunaga, Seiichiro; and Ikeda, Nobumasa, to Bridgestone Corporation. Pneumatic tire tread. 4,619,300, Cl. 152-209.00R.
Tokyo Electric Co., Ltd.: *See*—
Ono, Yoshiaki; and Kawaguchi, Katsuhiko, 4,619,388, Cl. 226-76.000.
Tokyo Juki Industrial Co., Ltd: *See*—
Iimura, Ikurou; Sakuma, Kuniharu; and Iwabuchi, Haruo, 4,619,213, Cl. 112-273.000.
Tokyo Keiki Company, Ltd.: *See*—
Numaho, Yoshio; Kato, Yoshio; Okada, Hiroshi; and Ogawa, Tetsuro, 4,620,137, Cl. 315-378.000.
Tokyo Rika Kikai Co., Ltd.: *See*—
Someya, Noboru, 4,619,473, Cl. 285-353.000.
Tokyo Shibaura Denki Kabushiki Kaisha: *See*—
Hattori, Motoichi; and Ishigo, Hideyasu, 4,620,065, Cl. 179-6.070.
Tomizuka, Masayoshi: *See*—
Auslander, David M.; Tomizuka, Masayoshi; Sagues, Paul; Ishida, Takashi; and Kamiyama, Shuichi, 4,619,237, Cl. 123-491.000.
Tomono, Hiroshi: *See*—
Andoh, Tsuyoshi; Kanamori, Toshio; Yamaguchi, Takashi; Tomono, Hiroshi; and Satake, Satoshi, 4,619,310, Cl. 164-448.000.
Tomy Kogyo Co. Inc.: *See*—
Seki, Yoshizo; and Bass, Sidney, 4,619,625, Cl. 446-89.000.
Tonnel, Eugene: *See*—
Arnould, Jacques; and Tonnel, Eugene, 4,620,213, Cl. 357-55.000.
Topert, Michael: *See*—
Annen, Klaus; Laurent, Henry; Hofmeister, Helmut; and Topert, Michael, 4,619,922, Cl. 514-180.000.
Toray Industries, Inc.: *See*—
Shoji, Hisataka; and Ouchi, Shigehiro, 4,619,963, Cl. 524-439.000.
Toshiba Audio Video Engineering Co., Inc.: *See*—
Tanaka, Tatsuo; and Shigematsu, Nana, 4,620,161, Cl. 330-257.000.
Toshiba Ceramics Co., Ltd.: *See*—
Tanaka, Takashi; and Hayashi, Kenro, 4,619,798, Cl. 264-62.000.
Touchstone Railway Supply & Mfg. Co., Inc.: *See*—
Rhodes, Wayne A.; and Harrington, Kenneth D., 4,619,313, Cl. 165-67.000.
Toyo Engineering Corporation: *See*—
Matsubara, Tetsuyuki; Ito, Norifumi; Sugazaki, Kazuo; Ichikawa, Kouzo; Iwamoto, Mune; and Ando, Toshihiko, 4,619,959, Cl. 524-228.000.
Toyoda Koki Kabushiki Kaisha: *See*—
Akabane, Hitoshi; and Ishiyama, Gen, 4,619,083, Cl. 51-289.00R.
Toyota Jidosha Kabushiki Kaisha: *See*—
Nakawaki, Yasunori, 4,619,634, Cl. 474-201.000.
Shigematsu, Takashi; Tokoro, Setsuo; and Watanabe, Tomoyuki, 4,619,629, Cl. 474-28.000.
Tsuru, Naohiko; and Nomura, Yoshihisa, 4,619,289, Cl. 137-627.500.
Toyotomi Kogyo Co., Ltd.: *See*—
Nakamura, Kazuharu; and Nakanishi, Yutaka, 4,619,603, Cl. 431-201.000.
Trachman, Edward G.; and Roper, Daniel W., to Rockwell International Corporation. Two speed axle shift actuator. 4,619,151, Cl. 74-335.000.
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A. Furnace construction. 4,619,209, Cl. 110-110.000.
Traeger, Mark A.: *See*—
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A., 4,619,209, Cl. 110-110.000.
Traeger, Randolph J.: *See*—
Traeger, Joseph P.; Traeger, Randolph J.; and Traeger, Mark A., 4,619,209, Cl. 110-110.000.
Traino, James C.; and Keene, Douglas L., to Xerox Corporation. Fast scan jitter measuring system for raster scanners. 4,620,237, Cl. 358-300.000.
Traynor, Sean G.: *See*—
Gorman, C. Rodney; Evans, James M.; and Traynor, Sean G., 4,620,028, Cl. 560-193.000.

Trebilcock, Robert W.: *See—*
Cescon, Lawrence A.; and Trebilcock, Robert W., 4,619,721, Cl. 149-21.000.
Triano, Alfred R.: *See—*
Chung, Kwong T.; and Triano, Alfred R., 4,620,127, Cl. 313-440.000.
Trocha, Jobst: *See—*
Herbert, Adolf; Bellmer, Klaus; and Trocha, Jobst, 4,619,599, Cl. 425-186.000.
Troupes, Demetrios: *See—*
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, 4,619,537, Cl. 400-225.000.
Troutman, Timmy D.: *See—*
Shank, Jeffrey B.; and Troutman, Timmy D., 4,619,387, Cl. 225-96.500.
Trummer, Gunther, to Diehl GmbH & Co. Sensor arrangement in a search head. 4,619,421, Cl. 244-3.160.
Trummer, Joseph A.; and Coulston, El L., to Kawneer Company, Inc. Thermally insulated composite frame member and method for manufacture. 4,619,097, Cl. 52-730.000.
Trumpf GmbH & Co.: *See—*
Leibinger, Berthold; and Herb, Eugen, 4,619,448, Cl. 269-303.000.
TRW Inc.: *See—*
Brooks, Robert E.; and Penunuri, David, 4,620,167, Cl. 333-195.000.
Tsao, Jeffrey Y.: *See—*
Bozler, Carl O.; Ehrlich, Daniel J.; and Tsao, Jeffrey Y., 4,619,894, Cl. 430-942.000.
Tschoepe, Norbert, to Siemens Aktiengesellschaft. Circuit arrangement for the recognition of static and dynamic faults in circuit assemblies. 4,620,303, Cl. 371-16.000.
Tsubokawa, Yoshitoki, to Yoshida Kogyo K. K. Slide fastener. 4,619,023, Cl. 24-394.000.
Tsubota, Motohiko: *See—*
Yuyama, Hideo; and Tsubota, Motohiko, 4,619,889, Cl. 430-406.000.
Tsuda, Keishiro: *See—*
Hato, Masakatsu; Shimura, Yukio; and Tsuda, Keishiro, 4,619,897, Cl. 435-182.000.
Tsudakoma Corp.: *See—*
Sainen, Tsutomu; and Asai, Takeshi, 4,619,294, Cl. 139-99.000.
Tsuno, Koichi: *See—*
Inoue, Kiyoshi; Kuwaki, Keiichi; and Tsuno, Koichi, 4,619,247, Cl. 128-6.000.
Tsuru, Naohiko; and Nomura, Yoshihisa, to Nippondenso Co., LTD.; and Toyota Jidosha Kabushiki Kaisha. Solenoid-controlled valve. 4,619,289, Cl. 137-627.500.
Tubular Fabricators Industry, Inc.: *See—*
Battiston, Joseph, 4,619,282, Cl. 135-67.000.
Tucel Industries, Inc.: *See—*
Lewis, John C., Jr., 4,619,485, Cl. 300-21.000.
Tumey, Michael L.: *See—*
Charbonneau, Robert R.; Heilmann, Steven M.; Rasmussen, Jerald K.; and Tumey, Michael L., 4,619,867, Cl. 428-355.000.
Tunnell, George W.: *See—*
Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Tunnell, George W.; and Zucker, Martin S., 4,620,099, Cl. 250-358.100.
Turcheck, Stanley P., Jr.: *See—*
Dean, Arthur L.; Brown, William R.; Martin, James P.; Turcheck, Stanley P., Jr.; Scott, Junius D.; and Gotal, John D., 4,619,356, Cl. 198-395.000.
Turck, Ernst. Filter cartridge for filtering apparatuses. 4,619,676, Cl. 55-500.000.
Tustison, Randal W.: *See—*
Saunders, Kenneth J.; and Tustison, Randal W., 4,619,792, Cl. 264-1.200.
Twardawa, Philip A.; and St-Onge, Michel C., to Canada, Her Majesty the Queen in right of. Tension link for parachute/payload separation. 4,619,424, Cl. 244-151.00B.
Twin Rivers Engineering: *See—*
Kennedy, T. Scott; and Herman, Paul F., 4,619,948, Cl. 521-52.000.
Ubowski, Lawrence W.: *See—*
McManus, John R.; and Ubowski, Lawrence W., 4,619,024, Cl. 29-157.30R.
Ucci, Pompelio A.: *See—*
Blyth, Randolph C.; Ucci, Pompelio A.; and McLellan, George R., 4,619,853, Cl. 428-95.000.
Uchida, Hiroshi: *See—*
Matsui, Isamu; Uchida, Hiroshi; Sekitani, Noboru; and Okumura, Hirokazu, 4,619,416, Cl. 242-35.50R.
Uchida, Kazumichi: *See—*
Shimizu, Isoo; Nomura, Hideki; Uchida, Kazumichi; and Mitsuyuki, Hitoshi, 4,620,056, Cl. 585-452.000.
Uchida, Mikio: *See—*
Shoji, Masao; Uchida, Mikio; and Kinoshita, Yoshio, 4,619,352, Cl. 192-41.00A.
Uchida, Wataru: *See—*
Tajima, Yoshio; Iwasaki, Yoshiharu; Kawabe, Kiyoshi; Uchida, Wataru; Sugita, Shoji; Matsuura, Kazuo; and Miyoshi, Mituji, 4,619,981, Cl. 526-125.000.
Ueda, Atsushi: *See—*
Okada, Tooru; Yokoyama, Takanao; Ueda, Atsushi; and Iwata, Toshio, 4,619,236, Cl. 123-425.000.
Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, to Mitsubishi Kinzoku Kabushiki Kaisha. Cubic boron nitride-based very high pressure-sintered material for cutting tools. 4,619,698, Cl. 75-238.000.
Ueda, Kazuhiko; Hitomi, Mitsuo; and Sasaki, Junzo, to Mazda Motor Corporation. Intake device for internal combustion engine. 4,619,226, Cl. 123-52.0MB.
Uehara, Makoto: *See—*
Shibuya, Masato; and Uehara, Makoto, 4,619,508, Cl. 353-122.000.
Ueng, Shou-Nan; and Golec, Frederick A., Jr., to USV Pharmaceutical Corp. Process for preparing carboalkoxy substituted benzoxazole compounds. 4,620,010, Cl. 548-217.000.
Ueno, Susumu; Nomura, Hirokazu; Hashizume, Shinobu; and Nishide, Toshiaki, to Shin-Etsu Chemical Co., Ltd; Emori & Co., Ltd; and Nikka Chemical Ind. Co., Ltd. Method for increasing color density and improving color fastness of dyed fabrics. 4,619,667, Cl. 8-444.000.
Uesugi, Naomoto; and Suzuki, Shoji, to Honda Giken Kogyo Kabushiki Kaisha. Composite sound and heat insulating board. 4,619,344, Cl. 181-229.000.
Uggeri, Fulvio; Castaldi, Graziano; and Giordano, Claudio, to Zambon S.p.A. Process for preparing alpha-aryl-alkanoic acids. 4,620,031, Cl. 562-466.000.
Uhl, Robert F.: *See—*
Burger, Laurie J.; Helfer, Joel N.; Protzmann, Donald E.; and Uhl, Robert F., 4,619,271, Cl. 128-736.000.
Uhlenkamp, Dirk: *See—*
Wendland, Broder; and Uhlenkamp, Dirk, 4,620,225, Cl. 358-141.000.
Uhlig, Uwe, to Hauni-Werke Korber & Co. KG. Grinding machine with protective hood for the grinding wheel. 4,619,078, Cl. 51-5.00D.
Ullman, Timothy J.: *See—*
Yates, John B., III; and Ullman, Timothy J., 4,619,971, Cl. 525-166.000.
Uni-Cardan Aktiengesellschaft: *See—*
Balken, Jochen; Beigang, Wolfgang; and Bihr, Bernhard, 4,619,627, Cl. 464-24.000.
Unie van Kunstmestfabrieken B.V.: *See—*
Mutsers, Stanislaus M. P., 4,619,843, Cl. 427-213.000.
Union Carbide Corporation: *See—*
Matzner, Markus; and Papuga, Donald M., 4,619,975, Cl. 525-437.000.
Union Oil Company of California: *See—*
Gartner, Ellis M., 4,619,702, Cl. 106-89.000.
Gritters, Gregory A.; and Perez, Jose M., 4,619,769, Cl. 210-747.000.
United Kingdom Atomic Energy Authority: *See—*
Marwick, Alan D.; and Sansom, Harry C., deceased, 4,619,030, Cl. 29-404.000.
United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
Lewis, Geoffrey A.; Timby, Ernest A.; and Walsh, Rodney H., 4,619,581, Cl. 415-143.000.
United States of America
Agriculture: *See—*
Frick, John G., Jr.; Jones, Brian W.; Stone, Robbie L.; and Watson, Michael D., 4,619,668, Cl. 8-496.000.
Air Force: *See—*
Armitage, David, 4,619,501, Cl. 350-386.000.
Giladett, Leo V., 4,619,199, Cl. 102-254.000.
Repperger, Daniel W.; Jennings, Thomas J.; and Ratino, David A., 4,619,506, Cl. 351-243.000.
Energy: *See—*
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,619,738, Cl. 202-85.000.
Ortiz, John P., 4,619,136, Cl. 73-38.000.
Zeren, Joseph D., 4,620,081, Cl. 219-121.0EE.
Health: *See—*
Dickey, Donna J.; Dobler, Sebastian; and Horejda, Natalie, 4,619,483, Cl. 297-397.000.
National Aeronautics and Space Administration: *See—*
Gisler, Gary L., 4,619,142, Cl. 73-462.000.
Holmes, Bruce J.; Martin, Glenn L.; Domack, Christopher S.; Obara, Clifford J.; and Hassan, Ahmed A., 4,619,423, Cl. 244-130.000.
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Ayers, Jack D.; and Anderson, Iver E., 4,619,845, Cl. 427-422.000.
Keller, Teddy M., 4,619,986, Cl. 528-99.000.
U.S. Philips Corporation: *See—*
Beelaard, Wilhelmus A. J.; and de Volder, Johannes A. P., 4,620,174, Cl. 335-212.000.
Beugin, Michel P., 4,619,432, Cl. 248-635.000.
Dijkstra, Kees; and Huizinga, Jan, 4,619,119, Cl. 62-324.200.
Jansen, Winfried; and Nolde, Wolfgang, 4,620,314, Cl. 381-4.000.
Maas, Henricus G. R.; Slotboom, Jan W.; Appels, Johannes A.; and Osinski, Kazimierz, 4,619,039, Cl. 29-591.000.
Peels, Antonius H. P. M.; van den Beld, Antonius J. M.; Bijma, Jan; and Gerritsen, Jan, 4,620,134, Cl. 315-15.000.
Prud'homme van Reine, Peter R., 4,620,131, Cl. 313-636.000.
Schouhamer Immink, Kornelis A., 4,620,311, Cl. 375-19.000.
Universal Flow Monitors, Inc.: *See—*
Rosaen, Lars O., 4,619,139, Cl. 73-198.000.
Universal Plastics, Inc.: *See—*
Boyce, N. Blake; and McSpadden, J. Neil, 4,619,207, Cl. 108-51.100.
Universal Propulsion Company, Inc.: *See—*
Marion, Frank A., 4,619,722, Cl. 149-41.000.

Universal Technic: *See—*
Landre, Bernard, 4,620,151, Cl. 324-127.000.
University of Cal., The Regents of the: *See—*
Urist, Marshall R., 4,619,989, Cl. 530-417.000.
University of California, The Regents of The: *See—*
Cubicciotti, Roger S.; Karu, Alexander E.; and Krauss, Ronald M., 4,619,895, Cl. 435-7.000.
Thomas, Gareth; Ahn, Jae-Hwan; and Kim, Nack-Joon, 4,619,714, Cl. 148-12.00B.
University of Florida: *See—*
Maren, Thomas H., 4,619,939, Cl. 514-363.000.
University of North Carolina: *See—*
Hanker, Jacob S.; Terry, Bill C.; Ambrose, Wallace W.; and Lupton, Cecel R., 4,619,655, Cl. 623-1.000.
Tidwell, Richard R.; Dubovi, Edward J.; and Geratz, Joachim D., 4,619,942, Cl. 514-415.000.
University of Rochester, The: *See—*
Sizer, Theodore, II; Duling, Irl N., III; Petras, Carl H.; and Letzring, Samuel A., 4,620,113, Cl. 307-270.000.
Untermyer, Samuel, II: *See—*
Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Schick, Timothy; and Untermyer, Samuel, II, 4,620,100, Cl. 250-358.100.
UOP Inc.: *See—*
Lambert, Susan L.; Lawson, Randy J.; Johnson, Russell W.; and Barr, Tery L., 4,619,906, Cl. 502-66.000.
Schnell, Robert P.; Sampson, Robert W.; Pacanowski, Ronald F.; and Bruggema, Donald J., 4,620,284, Cl. 364-498.000.
Zinnen, Hermann A., 4,620,047, Cl. 568-939.000.
Uphold, James D.; and Pfohl, Robert L., to Vitacomm, Ltd. Esophageal stethoscope and vital signs monitor system. 4,619,268, Cl. 128-671.000.
Upjohn Company, The: *See—*
Sih, John C., 4,619,997, Cl. 544-124.000.
Stringfellow, Dale A.; and Fast, Patricia E., 4,619,933, Cl. 514-272.000.
Urbach, Hansjorg: *See—*
Henning, Rainer; Urbach, Hansjorg; Teetz, Volker; and Becker, Reinhard, 4,620,012, Cl. 548-411.000.
Urban, Peter. Method of and apparatus for bonding an electrically conductive wire to bonding pads. 4,619,397, Cl. 228-111.000.
Urbani, William G., to Industrial Innovations, Inc. Vacuum loading cleaning system. 4,619,015, Cl. 15-302.000.
Urist, Marshall R., to University of Cal., The Regents of the. Bone morphogenetic protein composition. 4,619,989, Cl. 530-417.000.
Ursula, Ruth: *See—*
Quittkat, Jorg; Thiel, Gerhard; and Ursula, Ruth, 4,620,162, Cl. 331-45.000.
Uryu, Shunji: *See—*
Okamoto, Yoshiyuki; Sato, Kazuhiko; Uryu, Shunji; and Morita, Kiyoshi, 4,619,080, Cl. 51-251.000.
Ushifusa, Nobuyuki; Ogihara, Satoru; and Nagayama, Kosei, to Hitachi, Ltd. Multi-layer ceramic wiring circuit board and process for producing the same. 4,620,264, Cl. 361-414.000.
Usinor: *See—*
Francois, Bernard, 4,619,835, Cl. 427-8.000.
USM Corporation: *See—*
Allmann, Gunther; and Wiessler, Hans, 4,620,079, Cl. 219-98.000.
USV Pharmaceutical Corp: *See—*
Loev, Bernard; and Chan, Wan-Kit, 4,619,945, Cl. 514-729.000.
USV Pharmaceutical Corp.: *See—*
Ueng, Shou-Nan; and Golec, Frederick A., Jr., 4,620,010, Cl. 548-217.000.
Youssefyeh, Raymond D.; and Jones, Howard, 4,619,944, Cl. 514-513.000.
Utah Medical Products, Inc.: *See—*
Cutler, Christopher A.; and Wallace, William D., 4,619,269, Cl. 128-719.000.
Utino, Megumi: *See—*
Mitani, Katsuya; Sano, Toshihiro; Nomura, Nobutaka; Numata, Kou; and Utino, Megumi, 4,620,273, Cl. 364-136.000.
Utsunomiya, Yasuharu: *See—*
Maeda, Masahiko; Nakazawa, Toru; Utsunomiya, Yasuharu; and Wataki, Ryuji, 4,619,523, Cl. 355-15.000.
Valavaara, Viljo K., to Colic Machine & Tool Limited. Double-bladed power hacksaw. 4,619,166, Cl. 83-461.000.
Vale, Wylie W., Jr.; and Rivier, Jean E. F., to Salk Institute for Biological Studies, The. GNRH antagonists IIIB. 4,619,914, Cl. 514-15.000.
Vallone, Joseph: *See—*
Petkovic-Luton, Ruzica; and Vallone, Joseph, 4,619,699, Cl. 75-252.000.
Valyocsik, Ernest W., to Mobil Oil Corporation. Synthesis of ZSM-23 zeolite and the product produced. 4,619,820, Cl. 423-328.000.
Van Buskirk, Ellor J.: *See—*
Hart, Terence J.; Dowbenko, Rostyslaw; Maska, Rudolf; Van Buskirk, Ellor J.; and Tetenbaum, Marvin T., 4,619,952, Cl. 523-409.000.
van den Beld, Antonius J. M.: *See—*
Peels, Antonius H. P. M.; van den Beld, Antonius J. M.; Bijma, Jan; and Gerritsen, Jan, 4,620,134, Cl. 315-15.000.
van der Burgt, Maarten J., to Shell Oil Company. Self cleaning variable width annular slit atomizer. 4,619,400, Cl. 239-102.100.
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Henniger, Peter W.; and van der Drift, Johannes K., 4,619,786, Cl. 540-310.000.
van der Lely, Cornelis, to C. van der Lely N.V. Balers. 4,619,106, Cl. 56-341.000.
Van Laar, Jacobus: *See—*
Felthuis, Jacob; Van Laar, Jacobus; and Rengersen, Jacob, 4,619,441, Cl. 266-193.000.
Van Laere, Christiaan G. M. Hand-holdable electric power tool apparatus. 4,619,162, Cl. 81-464.000.
Vanlerberghe, Guy; and Sebag, Henri, to L'Oreal. Sequenced surfactant oligomers, process for preparing the same and compositions containing the same. 4,620,037, Cl. 568-36.000.
van Mierlo, Franciscus J. A., to Shell California Production Inc. Liner hanger with brass packer. 4,619,326, Cl. 166-382.000.
Van Noy, John H.: *See—*
Farrall, George A.; and Van Noy, John H., 4,620,123, Cl. 310-331.000.
Farrall, George A.; and Van Noy, John H., 4,620,124, Cl. 310-332.000.
Varian Associates, Inc.: *See—*
Lavering, Gordon R., 4,620,170, Cl. 333-252.000.
Variaset Pty. Limited: *See—*
Woodward, Lawrence, 4,619,876, Cl. 430-11.000.
Vasile, Carmine F.; and Vasile, Sheila F. Equal volume, contraflow heat exchanger. 4,619,311, Cl. 165-47.000.
Vasile, Sheila F.: *See—*
Vasile, Carmine F.; and Vasile, Sheila F., 4,619,311, Cl. 165-47.000.
Vasipari Kutato es Fejleszto Vallalat: *See—*
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Vath, Gunter: *See—*
Melzer, Milena; Jakusch, Helmut; Grau, Werner; Koster, Eberhard; Loser, Werner; Polke, Reinhard; Schadel, Gunter; Ohlinger, Manfred; and Vath, Gunter, 4,619,777, Cl. 252-62.540.
Vayda, R. Thaddeus: *See—*
Christiansen, Jean E.; Fitzgerald, Maryanne; Moeller, Mitchell G.; Pascalides, Artemis; and Vayda, R. Thaddeus, 4,619,660, Cl. 623-46.000.
VDO Adolf Schindling AG: *See—*
Collonia, Harald, 4,619,230, Cl. 123-325.000.
Kuhnel, Frank, 4,619,140, Cl. 73-295.000.
Vegla: *See—*
Halberschmidt, Friedrich; Reinmold, Heinz-Josef; Audi, Josef; Puetz, Cornelius; and Schubert, Gerd, 4,619,683, Cl. 65-351.000.
Verhoeven, Thomas R.: *See—*
Sletzinger, Meyer; and Verhoeven, Thomas R., 4,620,025, Cl. 558-401.000.
Vericom Corp.: *See—*
McCumber, Roger D.; and Teder, Rein S., 4,620,141, Cl. 318-483.000.
Verret, Douglas P.: *See—*
Hooper, Robert C.; Verret, Douglas P.; and Roane, Bobby A., 4,619,887, Cl. 430-313.000.
Ver Strate, Gary W.; Graessley, William W.; and Kresge, Edward N., to Exxon Research & Engineering Co. Hydrocarbon solutions of macromolecular polymers having an improved resistance to mechanical degradation. 4,620,048, Cl. 585-10.000.
Vickers, Incorporated: *See—*
Walters, Ronald B., 4,619,186, Cl. 91-433.000.
Victor Company of Japan, Limited: *See—*
Ono, Tsuyoshi, 4,620,241, Cl. 360-73.000.
Takanashi, Itsuo; Nakagaki, Shintaro; Ichimura, Hiroshi; Kuriyama, Takashi; and Negishi, Ichiro, 4,620,221, Cl. 358-47.000.
Vironneau, Pierre; and Prunet, Jean. Apparatus for the capture and transfer of radiation energy such as solar radiation. 4,619,243, Cl. 126-433.000.
Vitacomm, Ltd.: *See—*
Uphold, James D.; and Pfohl, Robert L., 4,619,268, Cl. 128-671.000.
Vizet, Philippe: *See—*
Tetaz, Roger; and Vizet, Philippe, 4,619,681, Cl. 65-29.000.
Voepel, Harry W.: *See—*
Wang, David C.; and Voepel, Harry W., 4,619,040, Cl. 29-596.000.
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Vogt, James A.: *See—*
Cullen, John S.; Incorvia, Samuel A.; and Vogt, James A., 4,619,673, Cl. 55-387.000.
Vollmer, Jurgen; and Frackenpohl, Alfred, to Jean Walterscheid GmbH. Coupling assembly having a retainer plate for guiding a coupling hook. 4,619,543, Cl. 403-114.000.
Vollrath, Hans-Peter: *See—*
Disselbeck, Dieter; and Vollrath, Hans-Peter, 4,619,317, Cl. 165-162.000.
von Ballmoos, Roland: *See—*
Derouane, Eric G.; and von Ballmoos, Roland, 4,619,818, Cl. 423-306.000.
Vorst, Carl J., to McDonnell Douglas Corporation. Digital-to-analog converter interpolator. 4,620,291, Cl. 364-607.000.
Vosler, Gale C.: *See—*
Mrenna, Stephen A.; and Vosler, Gale C., 4,620,076, Cl. 200-304.000.
W. R. Grace & Co.: *See—*
Knight, John R.; and Thwaites, Geoffrey R., 4,619,848, Cl. 428-35.000.
WABCO Ltd.: *See—*
Smith, Eric G., 4,619,348, Cl. 188-351.000.
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Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shun-ichi, 4,619,983, Cl. 526-247.000.

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Waggener, William N., to Fairchild Weston Systems, Inc. Digital demodulator for continuously phase or frequency modulated signals. 4,620,160, Cl. 329-104.000.

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Albertson, Douglas E.; Dyson, James O.; Fischer, Eugene B.; Gaudlitz, Robert T.; Haws, Lewis A.; Keritsis, Gus D.; Long, Louis L.; McClung, Charles S.; Nepomuceno, Jose G.; and Wagoner, Steven R., 4,619,276, Cl. 131-79.000.

Wakabayashi, Toshio: *See—*
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Waldron, Mark A.: *See—*
Leung, Tommy Y.; and Waldron, Mark A., 4,620,294, Cl. 364-900.000.

Walker, Landis C.; and Bailey, Marcus J. Gutter outlet tube. 4,619,554, Cl. 405-120.000.

Wallace, William D.: *See—*
Cutler, Christopher A.; and Wallace, William D., 4,619,269, Cl. 128-719.000.

Wallace, William H.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E. Computer system. 4,620,275, Cl. 364-200.000.

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Walsh, David J. Light attachment for speculum. 4,619,248, Cl. 128-18.000.

Walsh, Edward N.: *See—*
Cheng, Chung-Ping; Iacobucci, Paul A.; and Walsh, Edward N., 4,619,908, Cl. 502-214.000.

Walsh, Rodney H.: *See—*
Lewis, Geoffrey A.; Timby, Ernest A.; and Walsh, Rodney H., 4,619,581, Cl. 415-143.000.

Walters, Ronald B., to Vickers, Incorporated. Pressure relief valves. 4,619,186, Cl. 91-433.000.

Walton, Otis R.: *See—*
Lewis, Arthur E.; Braun, Robert L.; Mallon, Richard G.; and Walton, Otis R., 4,619,738, Cl. 202-85.000.

Walton, Ronald A. Leg conditioner for leg split type exercise. 4,619,454, Cl. 272-141.000.

Wang, David C.; and Voepel, Harry W., to Emerson Electric Co. Method of fabricating stator for a multiple pole dynamoelectric machine. 4,619,040, Cl. 29-596.000.

Warner-Lambert Company: *See—*
Butler, Donald E.; and L'Italien, Yvon J., 4,619,937, Cl. 514-323.000.
Cook, P. Dan; and McNamara, Dennis J., 4,619,996, Cl. 536-55.300.
Sharma, Shri C., 4,619,831, Cl. 426-93.000.

Warner, Sidney O., II, to Sequentia, Incorporated. Fiberglass reinforced plastic sheet material with fire retardant filler. 4,619,954, Cl. 523-516.000.

Waryasz, Richard E., to Combustion Engineering, Inc. Fluidized bed boiler in-bed tube support bracket. 4,619,315, Cl. 165-104.160.

Wataki, Ryuji: *See—*
Maeda, Masahiko; Nakazawa, Toru; Utsunomiya, Yasuharu; and Wataki, Ryuji, 4,619,523, Cl. 355-15.000.

Watanabe, Akira: *See—*
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Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.

Watanabe, Fumio; Hara, Yoshiaki; Miyamoto, Masao; Kusumoto, Yasuo; and Komaki, Syojiro, to Seiko Instruments & Electronics Ltd. Electron-impact type of ion source with double grid anode. 4,620,102, Cl. 250-427.000.

Watanabe, Fumio: *See—*
Tatsumi, Hisao; Kayata, Haruhiko; and Watanabe, Fumio, 4,620,199, Cl. 346-76.0PH.

Watanabe, Junji, to Kabushiki Kaisha Toshiba. Electronic visual image forming apparatus. 4,620,234, Cl. 358-285.000.

Watanabe, Koichiro: *See—*
Fujii, Setsuro; Hattori, Eizou; Hirata, Mitsuteru; Kunieda, Hisashi; Watanabe, Koichiro; and Ishihama, Hiroshi, 4,620,005, Cl. 544-391.000.

Watanabe, Moritsuna, to Midori Anzen Co., Ltd. Filter for air cleaners. 4,619,675, Cl. 55-498.000.

Watanabe, Tomoyuki: *See—*
Shigematsu, Takashi; Tokoro, Setsuo; and Watanabe, Tomoyuki, 4,619,629, Cl. 474-28.000.

Watanabe, Yoshinobu: *See—*
Miyamoto, Shigehiko; Watanabe, Yoshinobu; and Kishi, Yuriko, 4,620,197, Cl. 346-1.100.

Watson, Michael D.: *See—*
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Watt, Peter B., to Eastman Kodak Company. Disc film scanning apparatus. 4,620,235, Cl. 358-293.000.

Weatherford, James R.: *See—*
Wallach, Steven J.; Jones, Thomas M.; Marshall, Frank J.; Nobles, David A.; Fuka, Kent A.; Rowan, Steven M.; Wallace, William H.; Dozier, Harold W.; Chastain, David M.; Clark, John W.; Kolstad, Robert B.; Mankovich, James E.; Harris, Michael C.; Gruger, Jeffrey H.; Gant, Alan D.; Shelton, Harold D.; Weatherford, James R.; Kimmel, Arthur T.; Gostin, Gary B.; Hansen, Gilbert J.; Golenbieski, John M.; Spry, Larry W.; Matulka, Gerald; Lockhart, Gaynel J.; and Sydow, Michael E., 4,620,275, Cl. 364-200.000.

Weaver, Robert C. Universal adjustment hitch. 4,619,463, Cl. 280-475.000.

Webb, Don W.; and Bard, William B., to Phillips Petroleum Company. Control of polymerization reaction. 4,619,901, Cl. 436-55.000.

Weber, Kent, to Sundstrand Corporation. Back pressure regulating valve. 4,619,115, Cl. 62-217.000.

Weber, Walter; and Frank-Voeglein, Doris, to Siemens Aktiengesellschaft. Dental spray handpiece. 4,619,612, Cl. 433-80.000.

Wegmann & Co. GmbH: *See—*
Kratzenberg, Wolfgang, 4,619,615, Cl. 434-22.000.

Wegner, Juergen: *See—*
Olbrueck, Peter; Kluth, Hermann; Roederhoff, Bernhard; Dierichs, Wolfgang; and Wegner, Juergen, 4,619,711, Cl. 134-38.000.

Weifenbach, Harald: *See—*
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Weiss, Richard; and Delagneau, Hubert, to Reckitt & Colman, S.A. Method for reducing the water desorption of an active composition carried by a supporting medium. 4,619,824, Cl. 424-16.000.

Welch, M. Bruce, to Phillips Petroleum Company. Zinc aluminate double bond isomerization catalyst and double bond isomerization of olefins employing said catalyst. 4,620,053, Cl. 585-664.000.

Welding Institute of Canada: *See—*
Graville, Brian A.; and Shmakov, Edward, 4,620,082, Cl. 219-130.510.

Wells, Laura M.; Hawker, Fred D.; Dachniwskyj, Maryam L.; and Strobel, Charles W., to DeSoto, Inc. Process for drying polymeric beads and associating shading pigments therewith. 4,619,051, Cl. 34-9.000.

Wells, Melvin W.: *See—*
Osburn, Larry E.; and Wells, Melvin W., 4,619,052, Cl. 34-10.000.

Welmers, Thomas E., to American Semiconductor Equipment Technologies. Data handling system for a pattern generator. 4,620,288, Cl. 364-518.000.

Wendland, Broder; and Uhlenkamp, Dirk, to Robert Bosch GmbH. System for TV transmission. 4,620,225, Cl. 358-141.000.

Wenk, Erich: *See—*
Koziol, Konrad; and Wenk, Erich, 4,619,752, Cl. 204-286.000.

Werner, Karl H.: *See—*
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Werner & Pfleiderer: *See—*
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West, Robert A. Fishing lure assembly. 4,619,067, Cl. 43-42.090.

Westerman, Ted: *See—*
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Westinghouse Electric Corp.: *See—*
Bagalini, Dante, 4,620,171, Cl. 335-20.000.
Harman, Douglas G.; Green, Richard A.; and Bevilacqua, Bruce W., 4,619,128, Cl. 72-53.000.
Matty, Thomas C., 4,620,143, Cl. 318-811.000.
Mrenna, Stephen A.; and Vosler, Gale C., 4,620,076, Cl. 200-304.000.

Westvaco Corporation: *See—*
Cook, Stephen F.; Fisher, Harland S.; and Kosciuczyk, Theodore E., 4,619,726, Cl. 156-366.000.

Whelen Engineering Co., Inc.: *See—*
Ferenc, Robert A., 4,620,268, Cl. 362-74.000.

Whirlpool Corporation: *See—*
Linstromberg, William J., 4,619,221, Cl. 116-307.000.

Whitacre, James B.: *See—*
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Whiteman, Jack, to Hydril Company. Oilfield closing device operating system. 4,619,111, Cl. 60-632.000.

Whittaker, Brian F.: *See—*
Maczuszenko, Andrzej; Davison, Ernest; Otter, Brian; Whittaker, Brian F.; Novak, Christopher; and Landheer, Dolf, 4,619,515, Cl. 355-3.00R.

Wieczorek, Adam: *See—*
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Wieder, Klaus, to Remic Corporation. Communication headset. 4,620,068, Cl. 179-156.00A.

Wiedor, Duane E.: *See—*
Schultz, Stephen J.; Huebner, John F.; Wiedor, Duane E.; and Pribish, Dennis S., 4,620,309, Cl. 373-128.000.

Wiegers, Wilhelmus J.; Sprecker, Mark A.; and Schreiber, William L., to International Flavors & Fragrances Inc. Process for preparing mixture containing 2-campholenylidenbutanol, product produced thereby and perfumery uses thereof. 4,619,781, Cl. 252-522.00R.

Wiegers, Wilhelmus J., to International Flavors & Fragrances Inc. Norbornylbutadiene-acrolein adducts. 4,620,039, Cl. 568-445.000.

Wiessler, Hans: *See—*
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Wiggenhauser, Pedro, to Zahnradfabrik Friedrichshafen Aktiengesellschaft. Sliding gear for speed-changing transmission. 4,619,150, Cl. 74-332.000.

Wikstrom, Bengt R. Wind turbine. 4,619,583, Cl. 416-122.000.

Wilenius, George P. T.: *See—*
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Wiles, Vernon L., to Jamison Door Company. Horizontal sliding door. 4,619,075, Cl. 49-235.000.

Wilkomirsky, Igor A. E.: *See—*
Salter, Robert S.; Boorman, Roy S.; and Wilkomirsky, Igor A. E., 4,619,814, Cl. 423-27.000.

Willi Studer AG: *See—*
Gaskell, Philip S.; Lagadec, Roger; and McNally, Guy W. W., 4,620,238, Cl. 360-8.000.

William Cook, Europe A/S: *See—*
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Williams, Gregory A., to Zenith Electronics Corporation. Dual-mode timer circuit. 4,620,119, Cl. 307-595.000.

Williams, William J.; and Purkey, Richard E. Adjustable torque limiting valve handle. 4,619,437, Cl. 251-81.000.

Willingham, Jack. Poultry litter disintegrating machine. 4,619,412, Cl. 241-101.700.

Willis, Donald W. Rodent bait station. 4,619,071, Cl. 43-131.000.

Willow Technology, Inc.: *See—*
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Wills, Roger R.: *See—*
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Wilson, Burton D.: *See—*
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,002, Cl. 544-318.000.
Sandefur, Louise O.; Slusarek, Wojciech; Wilson, Burton D.; and Maggiulli, Cataldo A., 4,620,006, Cl. 544-402.000.

Wilson, Gary L.: *See—*
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Wilson, Joseph H.: *See—*
Harper, Allan C.; Wilson, Joseph H.; McKee, Randall G.; and Lasiter, David N., 4,619,409, Cl. 241-38.000.

Wilson, Ralph. Auxiliary outside air refrigerating mechanism. 4,619,114, Cl. 62-180.000.

Windmoller & Holscher: *See—*
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Wingen, Rainer; Geissler, Ulrich; and Ruckert, Hans, to Hoechst Aktiengesellschaft. Photopolymerizable composition comprising a 1,3,10-triazaanthracen-4-one as the photoinitiator. 4,619,885, Cl. 430-260.000.

Wingert, Rudolf: *See—*
Knispel, Barry; and Wingert, Rudolf, 4,619,394, Cl. 227-156.000.

Wint, Gregory A.: *See—*
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Winterling, Gerhard; and Koniger, Max, to Messerschmitt-Bolkow-Blohm. Semiconductor device for converting light into electric energy. 4,620,058, Cl. 136-258.000.

Wiscons, Bryon L.: *See—*
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Wisconsin Alumni Research Foundation: *See—*
DeLuca, Hector F.; Ikekawa, Nobuo; Kobayashi, Yoshiro; and Tanaka, Yoko, 4,619,920, Cl. 514-167.000.

Wisdom, Leonard A., to Miles Laboratories, Inc. Plasma bags. 4,619,650, Cl. 604-408.000.

Wistuba, Eberhard, to Karl Mengele & Sohne GmbH & Co. Forage or picking harvester. 4,619,413, Cl. 241-222.000.

Wistuba, Eberhard: *See—*
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Witte, Josef: *See—*
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Witthauer, Klaus: *See—*
Fremery, Johan K.; Lindenau, Bernd; and Witthauer, Klaus, 4,619,144, Cl. 73-708.000.

Witzel, Ulrich. Hip endoprosthesis. 4,619,659, Cl. 623-23.000.

Wolfseder, Alfred, to Gregor Hofbauer GmbH. Multiple tray-shaped packing and storage unit. 4,619,363, Cl. 206-373.000.

Won, Duk S. Stapler with staple storage area in base. 4,619,392, Cl. 227-120.000.

Won, In H., to Lee, Choon Woo. Pants with air ventilation panel. 4,619,004, Cl. 2-227.000.

Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., to Wood Manufacturing Company, Inc. Dual step, vee type planing hull for power boats. 4,619,215, Cl. 114-56.000.

Wood Manufacturing Company, Inc.: *See—*
Wood, Forrest L.; Jensen, Dale H.; Poley, Kenneth P.; Hoover, Charles C.; and Wilson, Gary L., 4,619,215, Cl. 114-56.000.

Woodward, Lawrence, to Variaset Pty. Limited. Flexible display image. 4,619,876, Cl. 430-11.000.

Worthington, Paul A.; and Shephard, Margaret C., to Imperial Chemical Industries PLC. Triazolyl ethanol derivatives. 4,620,011, Cl. 548-262.000.

Wotawa, Fred W. Fishing lure. 4,619,068, Cl. 43-42.110.

Wright, Andrew C. W., to Dzus Fastener Co. Inc. Quick-release fastener with intermittent threads. 4,619,569, Cl. 411-347.000.

Wright, Robert J., to Legato Pty. Ltd. (Musical) drums. 4,619,179, Cl. 84-413.000.

Wright, William B., Jr.; and Press, Jeffery B., to American Cyanamid Company. N-[(1H-imidazol-1-yl)alkyl]-1H-indolecarboxamides useful as thromboxane synthetase inhibitors and antihypertensive agents. 4,619,941, Cl. 514-397.000.

Wright, William E.: *See—*
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Wu, Chin-Lung: *See—*
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Wulling, Thomas E.: *See—*
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Wundrock, John A.: *See—*
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Wurster, Carl F.: *See—*
Magill, John W.; and Wurster, Carl F., 4,619,260, Cl. 128-309.000.

Wurtz, William O., to Willow Technology, Inc. Method and apparatus for discharging materials from a storage bin. 4,619,381, Cl. 222-272.000.

Wyke, Carol E.: *See—*
Do, Phuc K.; Wyke, Carol E.; Kendrick, Barnes R., Jr.; Hedrick, Dennis R.; and Troupes, Demetrios, 4,619,537, Cl. 400-225.000.

Xanar, Inc.: *See—*
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Xerox Corporation: *See—*
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Yabuki, Yoshiharu: *See—*
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Yagi, Manabu: *See—*
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Yagi, Tatsuhiko: *See—*
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Yahagi Engineering K.K.: *See—*
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Yakima Wire Works, Inc.: *See—*
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Yam, David S., to Dicomed Corporation. Method and apparatus for representation of a curve of uniform width. 4,620,287, Cl. 364-518.000.

Yamabe, Masaaki; Kojima, Gen; Wachi, Hiroshi; and Kodama, Shunichi, to Asahi Glass Company Limited. Copolymer for fluorine-containing elastomer having excellent low temperature resistance and alcohol resistance. 4,619,983, Cl. 526-247.000.

Yamada, Mutsuo: *See—*
Tanimoto, Hirotoshi; Yamada, Mutsuo; Arikawa, Yoshijiro; Kamiguchi, Taiji; Nishimura, Yasuyuki; and Kaku, Hiroyuki, 4,620,038, Cl. 568-401.000.

Yamada, Yasutsugu, to Nippon Tensaiseito Kabushiki Kaisha. Wood improver and a method of improving the quality of wood. 4,619,700, Cl. 106-15.050.

Yamaguchi, Nobutaka: *See—*
Okita, Tsutomu; Yamaguchi, Nobutaka; and Hashimoto, Hiroshi, 4,619,855, Cl. 428-143.000.

Yamaguchi, Susumu, to Diesel Kiki Co., Ltd. Fuel injection system for internal combustion engines. 4,619,233, Cl. 123-357.000.

Yamaguchi, Takashi: *See—*
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Yamaho Kogyo Co., Ltd.: *See—*
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Yamamoto, Kazuo: *See*—
Ueda, Fumihiro; Kawada, Kaoru; Yamamoto, Kazuo; Miwa, Noriaki; and Ishimatsu, Toshiki, 4,619,698, Cl. 75-238.000.
Yamamoto, Kenzo, to Yamaho Kogyo Co., Ltd. Nozzle for spraying agricultural chemicals. 4,619,402, Cl. 239-428.500.
Yamamoto, Susumu: *See*—
Kamuro, Yasuo; Hirai, Koichi; Suzuki, Fumio; Yamamoto, Susumu; and Shindo, Noboru, 4,619,685, Cl. 71-78.000.
Yamamoto, Toshio, to Kabushiki Kaisha Toshiba. Cold pressure-welding apparatus. 4,619,396, Cl. 228-102.000.
Yamana, Keiichi; Tachibana, Hajime; and Ohtsuka, Shuichi, to Fuji Photo Film Co., Ltd. Electrophotographic system. 4,619,513, Cl. 355-3.0CH.
Yamanaka, Isao, to Honda Giken Kogyo K.K. Choke lever device for a motor vehicle. 4,619,154, Cl. 74-489.000.
Yamane, Yasumasa: *See*—
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Yamashita, Noriyuki, to Sony Corporation. Pulse signal processing circuit. 4,620,312, Cl. 375-22.000.
Yamazaki, Etuo; and Matsuura, Hitoshi, to Fanuc Ltd. Sequence switching system in tracer control unit. 4,620,142, Cl. 318-578.000.
Yamazaki, Katsuya: *See*—
Kawanobe, Yasutaka; Noguti, Hisao; Kanou, Singi; and Yamazaki, Katsuya, 4,619,694, Cl. 75-59.140.
Yamazaki, Kiyoyasu: *See*—
Hama, Tomio; and Yamazaki, Kiyoyasu, 4,619,287, Cl. 137-513.300.
Yampolskaya, Ludmila. Cut and style—device for fashion haircutting-hairshaping and hairstyling. 4,619,280, Cl. 132-45.00R.
Yanagihara, Kazuhiko: *See*—
Takehara, Nobumitsu; Yanagihara, Kazuhiko; Ohnishi, Masahiro; and Harada, Shigeo, 4,620,096, Cl. 250-319.000.
Yang, James H. C., to Firestone Tire & Rubber Company, The. Nonpenetrating mechanical fastener for roofing membrane and method of applying same. 4,619,094, Cl. 52-410.000.
Yang, Tai-Her. Adjustable support arm-type three-dimensional work bench. 4,619,446, Cl. 269-88.000.
Yano, Mitsuru: *See*—
Suenaga, Makoto; Yano, Mitsuru; Ishihara, Yasuoki; and Ohtsuka, Kohki, 4,619,713, Cl. 148-3.000.
Yariv, Amnon: *See*—
Margalit, Shlomo; Chiu, Liew-Chuang; Smith, John S.; and Yariv, Amnon, 4,620,214, Cl. 357-63.000.
Yasue, Toshikazu; Mese, Michihiro; and Endo, Takeyuki, to Hitachi, Ltd. Speech recognition system. 4,620,316, Cl. 381-43.000.
Yasui, Yoshiharu: *See*—
Suzuki, Yoshihisa; Yasui, Yoshiharu; and Seiki, Kazuo, 4,619,109, Cl. 57-261.000.
Yasukawa, Kenichiro, to Pioneer Electronic Corp. PCM signal demodulating circuit. 4,620,158, Cl. 329-50.000.
Yates, John B., III; and Ullman, Timothy J., to General Electric Company. Linear polyester resin blends with high impact resistance. 4,619,971, Cl. 525-166.000.
Yavorsky, William M., to Ecodyne Corporation. Pressure vessel with an improved sidewall structure. 4,619,374, Cl. 220-414.000.
Yerkovich, Daniel: *See*—
Morgan, Carlton B.; Yerkovich, Daniel; Lyster, Thomas D.; Hagen, Eric C.; and Roberts, Douglas H., 4,619,265, Cl. 128-419.00D.
Yevich, Joseph P.: *See*—
New, James S.; Lobeck, Walter G., Jr.; and Yevich, Joseph P., 4,619,930, Cl. 514-252.000.
Yoda, Makoto: *See*—
Inoue, Hiroshi; Miyazaki, Makoto; Isoi, Masaaki; and Yoda, Makoto, 4,619,972, Cl. 525-193.000.
Yokogawa Hokushin Electric Corporation: *See*—
Hayashi, Eiji, 4,620,157, Cl. 328-160.000.
Yokota, Mitsuyoshi; and Matsumoto, Akio, to Mitsubishi Denki Kabushiki Kaisha. Pressure-responsive apparatus having hysteresis to prevent hunting. 4,620,073, Cl. 200-83.00P.
Yokoyama, Akira; and Ohmomo, Yoshiro, to Nihon Medi-Physics Co., Ltd. Radioactive iodine labeled metaraminol and diagnostic agent containing platelets labeled therewith. 4,619,823, Cl. 424-1.100.
Yokoyama, Takanao: *See*—
Okada, Tooru; Yokoyama, Takanao; Ueda, Atsushi; and Iwata, Toshio, 4,619,236, Cl. 123-425.000.
Yon, Gary. Wall corner finishing tool. 4,619,013, Cl. 15-235.800.
York, Rudy L.: *See*—
Parker, Sidney G.; and York, Rudy L., 4,620,209, Cl. 357-30.000.
Yoshida Kogyo K. K.: *See*—
Gartner, Karl, 4,619,091, Cl. 52-235.000.
Kaminaga, Hiromitsu, 4,619,092, Cl. 52-235.000.
Tsubokawa, Yoshitoki, 4,619,023, Cl. 24-394.000.
Yoshida Kogyo K.K.: *See*—
Yoshieda, Keiichi; and Sassa, Yuusei, 4,619,141, Cl. 73-865.900.
Yoshida, Masahiro: *See*—
Takahashi, Sankichi; Matsuzaki, Harumi; Mukushi, Toshimi; Ebara, Katsuya; Takakusagi, Tsunehiko; Yoshida, Masahiro; Sato, Joshiro; Yamane, Yasumasa; Sakaguchi, Katsumi; and Watanabe, Akira, 4,619,768, Cl. 210-739.000.
Yoshida, Yasuharu; and Yagi, Manabu, to NEC Corporation. Demodulator for multiphase PSK or multilevel QAM signals. 4,620,159, Cl. 329-50.000.
Yoshieda, Keiichi; and Sassa, Yuusei, to Yoshida Kogyo K.K. Inspection apparatus for slide fasteners. 4,619,141, Cl. 73-865.900.
Yoshimoto, Takeo; Hosono, Akira; Miki, Joh; Funakoshi, Yasunobu; Fujita, Takashi; and Hojo, Yoshikata, to Mitsui Toatsu Chemicals, Inc. Diphenyl ether derivatives and herbicides containing same. 4,619,689, Cl. 71-119.000.
Yoshimura, Isao; and Hata, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Highly-oriented stretchable multilayer film and process for producing the same. 4,619,859, Cl. 428-213.000.
Yoshimura, Shigeo; Shimada, Yoshiaki; and Kimura, Hitoshi, to Kubota Ltd. Load cell having flameproof function. 4,619,147, Cl. 73-862.380.
Yoshinari, Takashi, to Hitachi, Ltd. High-energy ignition device. 4,619,241, Cl. 123-620.000.
Yoshioka, Noriaki: *See*—
Kamiyama, Yoshiyasu; Yoshioka, Noriaki; and Nakagome, Keisuke, 4,619,767, Cl. 210-490.000.
Yoshitake, Hiroshi: *See*—
Hashimoto, Tadanori; Yoshitake, Hiroshi; Hata, Shigenao; and Nakazono, Akiko, 4,619,704, Cl. 106-286.400.
Young, Jean M.: *See*—
Kuenn, Cary K.; Young, Jean M.; and Wundrock, John A., 4,619,710, Cl. 134-22.170.
Young, Lock R., to Harris Corporation. TE_{10} rectangular to TE_{01} circular waveguide mode launcher. 4,620,163, Cl. 333-21.00R.
Youssefyeh, Raymond D.; and Jones, Howard, to USV Pharmaceutical Corporation. Antihypertensive compounds. 4,619,944, Cl. 514-513.000.
Yu, Jing-peir, to Monsanto Company. Self-texturing nylon yarn spinning process. 4,619,803, Cl. 264-176.200.
Yu, Kee C.: *See*—
Schols, John A.; and Yu, Kee C., 4,619,953, Cl. 523-465.000.
Yuki, Yoichi; and Ichida, Akito, to Daicel Chemical Industries, Ltd. Packing for use in resolution. 4,619,984, Cl. 528-38.000.
Yumoto, Osamu: *See*—
Hagiwara, Yoshimune; Sugiyama, Shizuo; Maeda, Narimichi; Yumoto, Osamu; Akazawa, Takashi; Kobayashi, Masahito; Kita, Yasuhiro; and Kita, Yuzo, 4,620,292, Cl. 364-748.000.
Yuyama, Hideo; and Tsubota, Motohiko, to Fuji Photo Film Co., Ltd. Image forming method. 4,619,889, Cl. 430-406.000.
Zaderej, Tony J.: *See*—
Zdanys, John, Jr.; Zaderej, Tony J.; and Robbins, Matthew A., 4,620,077, Cl. 200-331.000.
Zagorzycki, Peter E.: *See*—
George, Kurudamannil A.; and Zagorzycki, Peter E., 4,619,576, Cl. 414-300.000.
Zahnradfabrik Friedrichshafen Aktiengesellschaft: *See*—
Wiggenhauser, Pedro, 4,619,150, Cl. 74-332.000.
Zaidan Hojin Handotai Kenkyu Shinkokai: *See*—
Nishizawa, Jun-ichi, 4,619,811, Cl. 422-109.000.
Zambelli, Roberto. Instrument for carrying out biopsies on tissues removed from organs to be examined. 4,619,272, Cl. 128-753.000.
Zambon S.p.A.: *See*—
Uggeri, Fulvio; Castaldi, Graziano; and Giordano, Claudio, 4,620,031, Cl. 562-466.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. L-aminodicarboxylic acid gem-diamines. 4,619,782, Cl. 560-122.000.
Zanno, Paul R.; Barnett, Ronald E.; and Roy, Glenn M., to General Foods Corporation. Sweetening with L-aminodicarboxylic acid aminoalkenoic acid ester amides. 4,619,834, Cl. 426-548.000.
Zanussi Elettromeccanica S.p.A.: *See*—
De Faveri, Americo; Zanvettor, Sergio; and Savi, Antonio, 4,620,166, Cl. 333-184.000.
Zanvettor, Sergio: *See*—
De Faveri, Americo; Zanvettor, Sergio; and Savi, Antonio, 4,620,166, Cl. 333-184.000.
Zappia, Jean M.: *See*—
Reid, William J.; Zappia, Jean M.; Capocci, Gerald A.; and Spivack, John D., 4,619,957, Cl. 524-91.000.
Zaveri, Vikram: *See*—
Loewe, Gerhard; Nithammer, Egon; and Zaveri, Vikram, 4,619,031, Cl. 29-434.000.
Zdanys, John, Jr.; Zaderej, Tony J.; and Robbins, Matthew A., to CTS Corporation. Integral switch connector with remote actuator. 4,620,077, Cl. 200-331.000.
Zebisch, Manfred W., to International Standard Electric Corporation. Mounting support for several phototransmitters and photoreceivers. 4,620,091, Cl. 250-231.0SE.
Zeiler, Hans-Joachim: *See*—
Grohe, Klaus; Zeiler, Hans-Joachim; and Metzger, Karl G., 4,620,007, Cl. 546-156.000.
Zellweger Uster, Ltd.: *See*—
Leuenberger, Rolf; and Hunziker, Christian, 4,619,527, Cl. 356-238.000.
Zeman, Hans. Method for bending sheets. 4,619,131, Cl. 72-173.000.
Zenith Electronics Corporation: *See*—
Krause, Charles A.; and Rajaram, Babu, 4,620,186, Cl. 340-703.000.
Manske, Hans E., 4,620,126, Cl. 313-325.000.
Williams, Gregory A., 4,620,119, Cl. 307-595.000.
Zepp, Charles M.: *See*—
Locatell, Louis, Jr.; Zepp, Charles M.; and Cieciuch, Ronald F., 4,619,784, Cl. 540-593.000.
Zeren, Joseph D., to United States of America, Energy. Self-contained hot-hollow cathode gun source assembly. 4,620,081, Cl. 219-121.0EE.

Zielinski, Erich: *See*—
Pehker, Manfred; Zielinski, Erich; Metz, Josef; and Bierwirth, Adolf P., 4,619,181, Cl. 89-34.000.
Zimmermann, Heinz, to Linde Aktiengesellschaft. Two stage hydrotreating pretreatment in production of olefins from heavy hydrocarbons. 4,619,757, Cl. 208-57.000.
Zimmermann, Herbert; Poupko, Raphi; Luz, Zeev; and Billard, Jean, to Max-Planck-Gesellschaft zur Foerderung der Wissenschaften E.V. Pyramidal liquid crystals. 4,619,788, Cl. 260-410.500.
Zinnen, Hermann A., to UOP Inc. Process for the separation of orthonitrotoluene. 4,620,047, Cl. 568-939.000.
Zucker, Martin S.: *See*—
Schoenig, Frederick C., Jr.; Glendinning, Sharon G.; Tunnell, George W.; and Zucker, Martin S., 4,620,099, Cl. 250-358.100.
Zunkel, Gary D., to Halliburton Company. Well surging method and system. 4,619,325, Cl. 166-374.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 28TH DAY OF OCTOBER, 1986

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Bisk, Leonard; and Rogahn, Gunther, to Independent Products Company, Inc. Plastic clip. Re. 32,269, Cl. 223-91.000.

Fujioka, Akira: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, to Sumitomo Chemical Company, Limited; and Nippon Sheet Glass Co., Ltd. Non-fogging coating composition and a shaped article coated therewith. Re. 32,272, Cl. 524-114.000.

Gurewich, Victor: *See—*
Husain, Syed S.; Lipinski, Boguslaw; and Gurewich, Victor, Re. 32,271, Cl. 435-215.000.

Husain, Syed S.; Lipinski, Boguslaw; and Gurewich, Victor. Isolation of plasminogen activators useful as therapeutic and diagnostic agents. Re. 32,271, Cl. 435-215.000.

Independent Products Company, Inc.: *See—*
Bisk, Leonard; and Rogahn, Gunther, Re. 32,269, Cl. 223-91.000.

James River-Norwalk, Inc.: *See—*
Murray, Lee J., Jr., Re. 32,270, Cl. 428-335.000.

Lipinski, Boguslaw: *See—*
Husain, Syed S.; Lipinski, Boguslaw; and Gurewich, Victor, Re. 32,271, Cl. 435-215.000.

Murray, Lee J., Jr., to James River-Norwalk, Inc. Polyester coated paperboard for forming food containers and process for producing the same. Re. 32,270, Cl. 428-335.000.

Nippon Sheet Glass Co., Ltd.: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

Ohtani, Noboru: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

Rogahn, Gunther: *See—*
Bisk, Leonard; and Rogahn, Gunther, Re. 32,269, Cl. 223-91.000.

Sakiyama, Kazuo: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

Sumitomo Chemical Company, Limited: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

Yoshida, Motoaki: *See—*
Funaki, Masaaki; Ohtani, Noboru; Yoshida, Motoaki; Fujioka, Akira; and Sakiyama, Kazuo, Re. 32,272, Cl. 524-114.000.

LIST OF DESIGN PATENTEES

Acufex Microsurgical Inc.: *See—*
Lichtman, Philip R.; and Strahan, John C., 286,438, Cl. D24-26.000.

Appel, Mel; and Kress, George, to Mel Appel Company, The. Toy barn. 286,418, 10-28-86, Cl. D21-116.000.

Aqua Meter Instrument Corporation: *See—*
Grilk, Henry G., 286,384, Cl. D10-46.000.

Ark-Plas Products Inc.: *See—*
Hill, Royce W., 286,372, Cl. D8-387.000.
Hill, Royce W., 286,373, Cl. D8-387.000.

Asaki, James T., to ITT Corporation. Telephone set. 286,401, 10-28-86, Cl. D14-53.000.

Atkinson, Robert W., to Snyder Laboratories, Inc. Medical control panel for an irrigation, lavage and suction apparatus or the like. 286,435, 10-28-86, Cl. D24-8.000.

B.V.A.S. r.l.: *See—*
Pappalardo, Vittorio, 286,414, Cl. D19-66.000.

Banfield, Michael G. Packaging container. 286,378, 10-28-86, Cl. D9-346.000.

Bianco, Andrew S., to Dyson-Kissner-Moran Corporation, The. Combined liquid container and rotatable spout. 286,376, 10-28-86, Cl. D9-341.000.

Bonifield, Charles B.: *See—*
Johnson, William P.; and Bonifield, Charles B., 286,394, Cl. D12-156.000.

Botros, Radamis: *See—*
Parshad, David; Butram, Waco; and Botros, Radamis, 286,403, Cl. D14-59.000.

Bourgeois, Bruce E. Mailing envelope. 286,412, 10-28-86, Cl. D19-3.000.

Braun Aktiengesellschaft: *See—*
Ullmann, Roland, 286,451, Cl. D28-49.000.
Ullmann, Roland, 286,452, Cl. D28-49.000.

Brother Kogyo Kabushiki Kaisha: *See—*
Itoh, Kazuo; Goto, Makoto; and Isaji, Yasuyo, 286,407, Cl. D15-127.000.

Bulgari, Gianni, to Sotiro Bulgari Di Costantino E Giorgio Bulgari S.a.S. Wristwatch band. 286,385, 10-28-86, Cl. D11-19.000.

Bussell, Vanda J. Toothbrush holder. 286,349, 10-28-86, Cl. D6-534.000.

Bussell, Vanda J. Soap dish. 286,354, 10-28-86, Cl. D6-536.000.

Bussell, Vanda J. Soap dish. 286,355, 10-28-86, Cl. D6-536.000.

Bussell, Vanda J. Soap dish. 286,356, 10-28-86, Cl. D6-536.000.

Bussell, Vanda J. Lotion dispensing bottle. 286,374, 10-28-86, Cl. D9-300.000.

Butram, Waco: *See—*
Parshad, David; Butram, Waco; and Botros, Radamis, 286,403, Cl. D14-59.000.

Camens, Murray I. C., to U.S. Philips Corporation. Lady shaver. 286,453, 10-28-86, Cl. D28-49.000.

Capitol Products Corporation: *See—*
Schmidt, Dietrich F., 286,434, Cl. D25-52.000.

Caroli, Italo; and Tienken, Alfred G., to Dietz, R. E. Lens for hazard warning lamp or similar article. 286,446, 10-28-86, Cl. D26-123.000.

Cesaroni, William C.: *See—*
Gremonprez, Dan E.; and Cesaroni, William C., 286,365, Cl. D7-321.000.
Gremonprez, Dan E.; and Cesaroni, William C., 286,366, Cl. D7-321.000.

Challans, John C., to Plessey Overseas Limited. Electrical connector socket. 286,397, 10-28-86, Cl. D13-24.000.

Citizen Watch Co., Ltd.: *See—*
Matsuo, Jiro, 286,382, Cl. D10-39.000.

Coachmen Industries, Inc.: *See—*
Johnson, William P.; and Bonifield, Charles B., 286,394, Cl. D12-156.000.

Combustion Engineering, Inc.: *See—*
Luciano, Thomas J., 286,396, Cl. D13-23.000.

Corner, Horace B.: *See—*
Wirts, Harold L.; and Corner, Horace B., 286,370, Cl. D8-356.000.

Cosco, Inc.: *See—*
Knoedler, Roy E., 286,351, Cl. D6-390.000.

Crossley, Ronald L.: *See—*
Korthoff, Herbert W.; and Crossley, Ronald L., 286,442, Cl. D24-27.000.

Darome, Inc.: *See—*
Parshad, David; Butram, Waco; and Botros, Radamis, 286,403, Cl. D14-59.000.

Dart Industries Inc: *See—*
Zieff, Mark P., 286,361, Cl. D7-45.000.

Dart Industries, Inc.: *See—*
Gremonprez, Dan E.; and Cesaroni, William C., 286,365, Cl. D7-321.000.
Gremonprez, Dan E.; and Cesaroni, William C., 286,366, Cl. D7-321.000.
Trivison, Jody A., 286,360, Cl. D7-17.000.

Davidson, Bette B. Medallion. 286,389, 10-28-86, Cl. D11-114.000.

DeFrancesco, John C. Violin learning board. 286,413, 10-28-86, Cl. D19-59.000.

Dickerson, Dorothy M. Angel-doll. 286,422, 10-28-86, Cl. D21-169.000.

Dietz, R. E.: *See—*
Caroli, Italo; and Tienken, Alfred G., 286,446, Cl. D26-123.000.

Diffrient, Niels. Chair. 286,350, 10-28-86, Cl. D6-366.000.

Dillard, James W. Walking stilt. 286,415, 10-28-86, Cl. D21-72.000.

Dyson-Kissner-Moran Corporation, The: *See—*
Bianco, Andrew S., 286,376, Cl. D9-341.000.

Ekstrand, Johan A. I. Mounting for a sighting instrument. 286,424, 10-28-86, Cl. D22-110.000.

Forecast Lighting Company: *See—*
Sink, Mark, 286,445, Cl. D26-86.000.

Fratelli Guzzini S.p.A.: *See—*
Gecchelin, Bruno, 286,364, Cl. D7-317.000.

Fukuda, Harumi: *See*—
Kosako, Mikio; and Fukuda, Harumi, 286,409, Cl. D16-32.000.

Gahan, Geoffrey D., to Mouldmaking Design Centre Limited. Combined stand and housing for video display unit. 286,406, 10-28-86, Cl. D14-113.000.

Gaudet, Herbert L., Sr. Bathroom cabinet. 286,348, 10-28-86, Cl. D6-516.000.

Gecchelin, Bruno, to Fratelli Guzzini S.p.A. Transparent jug. 286,364, 10-28-86, Cl. D7-317.000.

Geisler, Bradley L. Combined support and stand for a needlework frame. 286,343, 10-28-86, Cl. D3-26.000.

Goto, Makoto: *See*—
Itoh, Kazuo; Goto, Makoto; and Isaji, Yasuyo, 286,407, Cl. D15-127.000.

Greco, Vincent. Panel for rolling gates. 286,433, 10-28-86, Cl. D25-50.000.

Green, David T.; Rawson, Paul O.; and Yagami, Richard, to United States Surgical Corporation. Combined surgical occluding and cutting instrument. 286,439, 10-28-86, Cl. D24-26.000.

Green, David T., to United States Surgical Corporation. Cartridge for surgical fastener applying apparatus. 286,440, 10-28-86, Cl. D24-27.000.

Green, David T.: *See*—
Korthoff, Herbert W.; and Green, David T., 286,441, Cl. D24-27.000.

Greenlaw, John W.; Kettlitz, Karsten; and Schlueter, Gary R. Articulated rear view mirror for attachment to eye glasses. 286,395, 10-28-86, Cl. D12-189.000.

Gremonprez, Dan E.; and Cesaroni, William C., to Dart Industries, Inc. Percolator. 286,365, 10-28-86, Cl. D7-321.000.

Gremonprez, Dan E.; and Cesaroni, William C., to Dart Industries, Inc. Percolator. 286,366, 10-28-86, Cl. D7-321.000.

Grilk, Henry G., to Aqua Meter Instrument Corporation. Depth sounder. 286,384, 10-28-86, Cl. D10-46.000.

Groce, Nathan W. Statuette. 286,390, 10-28-86, Cl. D11-157.000.

Groth, Hugh F., to Regina Co., Inc., The. Fold down wheels for carpet cleaner. 286,456, 10-28-86, Cl. D32-31.000.

GTE Telenet Communications Corporation: *See*—
Skigen, Jeffrey A.; Lum, James C. P.; and Taylor, C. Thomas, 286,404, Cl. D14-63.000.

Haase, Gerald A. Magnetic fish lure holder. 286,425, 10-28-86, Cl. D22-22.000.

Hahn Manufacturing Co.: *See*—
Hahn, Ronald R., 286,369, Cl. D8-72.000.

Hahn, Ronald R., to Hahn Manufacturing Co. Clamp. 286,369, 10-28-86, Cl. D8-72.000.

Hara, Kunio, to Kabushiki Kaisha Toshiba. Paper feeder for electronic copying machine. 286,410, 10-28-86, Cl. D16-32.000.

Harman, Walter D. Pouring spout. 286,380, 10-28-86, Cl. D9-447.000.

Hartley, Donald L. Ashtray. 286,448, 10-28-86, Cl. D27-27.000.

Hashimoto, Kazunori: *See*—
Iwasaki, Masakatu; Hyuga, Hideo; and Hashimoto, Kazunori, 286,405, Cl. D14-78.000.

Hedstrom Corporation: *See*—
Saxman, D. Scott; and Ziegler, William H., Jr., 286,423, Cl. D21-244.000.

Henke, Mitchell C.; and Wolfe, Donald G., to Lincoln Manufacturing Company, Inc. Oven. 286,368, 10-28-86, Cl. D7-338.000.

Hestair Kiddicraft Limited: *See*—
Thomson, Harry S.; Raffo, David M.; and Pape, John A., 286,443, Cl. D24-45.000.

Higashide, Daisuke: *See*—
Kuramochi, Izumi; Tokizaki, Hiroshi; Saneto, Kazuyoshi; and Higashide, Daisuke, 286,393, Cl. D12-147.000.

Hill, Royce W., to Ark-Plas Products Inc. Bolt. 286,372, 10-28-86, Cl. D8-387.000.

Hill, Royce W., to Ark-Plas Products Inc. Screw. 286,373, 10-28-86, Cl. D8-387.000.

Hitachi Ltd.: *See*—
Iwasaki, Masakatu; Hyuga, Hideo; and Hashimoto, Kazunori, 286,405, Cl. D14-78.000.

Huber, Connie K. Combination handset telephone and stand set. 286,402, 10-28-86, Cl. D14-53.000.

Huculak, William. Adjustable computer stand. 286,352, 10-28-86, Cl. D6-430.000.

Huffman, Ronald E., to KV33 Corporation. Dental articulator with a tab mounting. 286,436, 10-28-86, Cl. D24-10.000.

Hughes, James E., Jr. Serving tray for an automobile. 286,344, 10-28-86, Cl. D3-40.000.

Hyuga, Hideo: *See*—
Iwasaki, Masakatu; Hyuga, Hideo; and Hashimoto, Kazunori, 286,405, Cl. D14-78.000.

Isaji, Yasuyo: *See*—
Itoh, Kazuo; Goto, Makoto; and Isaji, Yasuyo, 286,407, Cl. D15-127.000.

Ishida, Mitsugi. Diamond. 286,387, 10-28-86, Cl. D11-90.000.

Ishida, Mitsugi. Diamond. 286,388, 10-28-86, Cl. D11-90.000.

Itoh, Kazuo; Goto, Makoto; and Isaji, Yasuyo, to Brother Kogyo Kabushiki Kaisha. Machine for cutting workpieces utilizing electric discharge. 286,407, 10-28-86, Cl. D15-127.000.

ITT Corporation: *See*—
Asaki, James T., 286,401, Cl. D14-53.000.

Iwasaki, Masakatu; Hyuga, Hideo; and Hashimoto, Kazunori, to Hitachi Ltd. Video camera. 286,405, 10-28-86, Cl. D14-78.000.

Jankowski, Michael T.; and Meelen, Hans T., to U.S. Philips Corporation. Lighting fixture. 286,444, 10-28-86, Cl. D26-65.000.

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451 R 4,619,224

CLASS 123

3 4,619,225
52 MB 4,619,226
146.5 A 4,619,227
182 4,619,228
286 4,619,229
325 4,619,230
333 4,619,231
339 4,619,232
357 4,619,233
4,619,234
425 4,619,236
440 4,619,235
491 4,619,237
502 4,619,238
506 4,619,239
575 4,619,240
620 4,619,241

CLASS 126

110 R 4,619,242
433 4,619,243
451 4,619,244

CLASS 128

1 R 4,619,245
4,619,246
6 4,619,247
18 4,619,248
23 4,619,249
26 4,619,250
79 4,619,251
82.1 4,619,252
201.23 4,619,254
202.27 4,619,255
303 R 4,619,256
303.1 4,619,257
303.14 4,619,258
305 4,619,259
309 4,619,260
325 4,619,261
334 R 4,619,262
344 4,619,263
419 D 4,619,265
419 F 4,619,264
639 4,619,266
660 4,619,267
671 4,619,268
719 4,619,269
721 4,619,270
736 4,619,271
753 4,619,272
771 4,619,273
772 4,619,274
783 4,619,275

CLASS 131

79 4,619,276
94 4,619,277
284 4,619,278
345 4,619,279

CLASS 132

45 R 4,619,280

CLASS 134

2 4,619,706
3 4,619,707
6 4,619,708
22.14 4,619,709
22.17 4,619,710
38 4,619,711

CLASS 135

20 M 4,619,281
67 4,619,282

CLASS 136

258 4,620,058

CLASS 137

15 4,619,283
67 4,619,284
68.2 4,619,285
81.1 4,619,286
513.3 4,619,287
554 4,619,288
627.5 4,619,289

CLASS 138

39 4,619,290
109 4,619,291
113 4,619,292

CLASS 139

13 R 4,619,293
99 4,619,294
304 4,619,295
435 4,619,296

CLASS 141

20 4,619,297
384 4,619,298

CLASS 144

357 4,619,299

CLASS 148

2 4,619,712
3 4,619,713
12 B 4,619,714
23 4,619,715
26 4,619,716
112 4,619,717
171 4,619,718
188 4,619,719
403 4,619,720

CLASS 149

21 4,619,721
41 4,619,722

CLASS 152

209 R 4,619,300
210 4,619,301
398 4,619,302
416 4,619,303

CLASS 156

62.2 4,619,723
72 4,619,724
182 4,619,725
366 4,619,726
541 4,619,727
555 4,619,728
606 4,619,729
617 SP 4,619,730
644 4,619,731

CLASS 160

135 4,619,304
263 4,619,305

CLASS 162

29 4,619,732
30.1 4,619,733
111 4,619,734
135 4,619,735
261 4,619,736
357 4,619,737

CLASS 164

150 4,619,306
169 4,619,307
416 4,619,308
430 4,619,309
448 4,619,310

CLASS 165

47 4,619,311
57 4,619,312
67 4,619,313
104.16 4,619,314
4,619,315
104.33 4,619,316
162 4,619,317

CLASS 166

.55 4,619,318
55.1 4,619,319
65.1 4,619,320
90 4,619,321
241 4,619,322
285 4,619,323
344 4,619,324
374 4,619,325
382 4,619,326

CLASS 169

38 4,619,327
75 4,619,328

CLASS 172

21 4,619,329
311 4,619,330
518 4,619,331

CLASS 174

42 4,620,059
4,620,060
51 4,620,061
65 R 4,619,332

CLASS 175

4.52 4,619,333
321 4,619,334
339 4,619,335

CLASS 177

1 4,619,336
210 R 4,619,337

CLASS 178

18 4,620,062

CLASS 179

2 A 4,620,063
2 C 4,620,064
6.07 4,620,065
27 D 4,620,066
146 R 4,620,067
156 A 4,620,068
175.3 R 4,620,069
4,620,070

CLASS 180

142 4,619,338
143 4,619,339
209 4,619,340
335 4,619,341

CLASS 181

184 4,619,342
208 4,619,343
229 4,619,344

CLASS 184

109 4,619,345

CLASS 187

9 E 4,619,346

CLASS 188

72.6 4,619,347
351 4,619,348
380 4,619,349

CLASS 192

3.31 4,619,350
35 4,619,351
41 A 4,619,352
70.18 4,619,353
89 B 4,619,354

CLASS 198

323 4,619,355
395 4,619,356
412 4,619,357
457 4,619,358
463.5 4,619,359
471.1 4,619,360

CLASS 200

6 BA 4,620,071
81 R 4,620,072
83 P 4,620,073
144 B 4,620,074
159 B 4,620,075
304 4,620,076
331 4,620,077

CLASS 202

85 4,619,738

CLASS 204

1 T 4,619,739
15 4,619,740
4,619,741
34 4,619,742
77 4,619,743
105 R 4,619,744
151 4,619,745
181.1 4,619,746
182.3 4,619,747
192.31 4,619,748
228 4,619,749
243 R 4,619,750
267 4,619,751
286 4,619,752
290 F 4,619,753
290 R 4,619,754
298 4,619,755

CLASS 206

204 4,619,361
326 4,619,362
373 4,619,363
379 4,619,364
503 4,619,365
507 4,619,366

CLASS 208

48 AA 4,619,756
57 4,619,757
85 4,619,758
210 4,619,759

CLASS 209

166 4,619,760
250 4,619,761
608 4,619,367

CLASS 210

170 4,619,762
177 4,619,763
248 4,619,764
289 4,619,765
482 4,619,766
490 4,619,767
739 4,619,768
747 4,619,769
772 4,619,770
788 4,619,771

CLASS 211

41 4,619,368

CLASS 212

189 4,619,369

CLASS 215

225 4,619,370

CLASS 218

156 4,619,253

CLASS 219

10.55 B 4,620,078
98 4,620,079
121 EE 4,620,081
121 PP 4,620,080
130.51 4,620,082
491 4,620,083
497 4,620,084
528 4,620,085
552 4,620,086

CLASS 220

71 4,619,371
90.4 4,619,372
354 4,619,373
414 4,619,374

CLASS 221

186 4,619,375
243 4,619,376

CLASS 222

83 4,619,377
144.5 4,619,378
153 4,619,379
240 4,619,380
272 4,619,381
327 4,619,382
556 4,619,383

CLASS 223

77 4,619,384
91 Re.32,269
96 4,619,385

CLASS 224

277 4,619,386

CLASS 225

96.5 4,619,387

CLASS 226

76 4,619,388
79 4,619,389
162 4,619,390

CLASS 227

19 4,619,391
120 4,619,392
136 4,619,393
156 4,619,394

CLASS 228

4.5 4,619,395
102 4,619,396
111 4,619,397

CLASS 229

17 G 4,619,398
72 4,619,399

CLASS 235

379 4,620,087
443 4,620,088

CLASS 239

102.1 4,619,400
214.17 4,619,401
428.5 4,619,402
456 4,619,403
461 4,619,404
675 4,619,405

CLASS 241

5 4,619,406
30 4,619,407
34 4,619,408
38 4,619,409
55 4,619,410
101.4 4,619,411
101.7 4,619,412
222 4,619,413
261.3 4,619,414

CLASS 242

18 G 4,619,415
35.5 R 4,619,416
107.4 A 4,619,417
4,619,418
4,619,419
198 4,619,420

CLASS 244

3.16 4,619,421
127 4,619,422
130 4,619,423
151 B 4,619,424

CLASS 246

34 R 4,619,425

CLASS 248

174 4,619,426
178 4,619,427
221.2 4,619,428
447.2 4,619,429
467 4,619,430
500 4,619,431
635 4,619,432

CLASS 249

18 4,619,433

CLASS 250

201 4,620,089
223 B 4,620,090
231 P 4,620,093
231 SE 4,620,091
4,620,092
4,620,094
281 4,620,095
319 4,620,096
327.2 4,620,097
4,620,098
358.1 4,620,099
4,620,100
376 4,620,101
427 4,620,102
440.1 4,620,103
493.1 4,620,104
505.1 4,620,105
506.1 4,620,106
566 4,620,107

CLASS 251

14 4,619,434
25 4,619,435
61.1 4,619,436
81 4,619,437
129.01 4,619,438

CLASS 252

8.514 4,619,772
4,619,773
8.551 4,619,776
8.7 4,619,774
8.8 4,619,775
62.54 4,619,777
70 4,619,778
91 4,619,779
522 R 4,619,780
4,619,781

CLASS 254

45 4,619,439

CLASS 256

47 4,619,440

CLASS 260

410.5 4,619,788
412.6 4,619,789
413 4,619,790
549 4,619,791

CLASS 264

1.2 4,619,792
2.6 4,619,793
4.1 4,619,794
4.6 4,619,795
29.4 4,619,796
29.5 4,619,805
40.1 4,619,797
62 4,619,798
101 4,619,799
139 4,619,800
146 4,619,801
171 4,619,802
176.2 4,619,803
220 4,619,804
522 4,619,806

CLASS 266

88 4,619,693
193 4,619,441
4,619,442
220 4,619,443
236 4,619,444

CLASS 267

100 4,619,445

CLASS 269

88 4,619,446
221 4,619,447
303 4,619,448

CLASS 270

5 4,619,449

CLASS 271

35 4,619,450
274 4,619,451
305 4,619,452

CLASS 272

117 4,619,453
141 4,619,454

CLASS 273

118 R 4,619,455
127 B 4,619,456
269 4,619,457

CLASS 277

24 4,619,458
235 B 4,619,459

CLASS 279

19 4,619,460
19.3 4,619,461

CLASS 280

242 R 4,619,462
475 4,619,463
655 4,619,464
661 4,619,465
669 4,619,466
708 4,619,467
801 4,619,468

CLASS 283

76 4,619,469

CLASS 285

55 4,619,470
158 4,619,471
334 4,619,472
353 4,619,473

CLASS 294

9 4,619,474
90 4,619,475

CLASS 296

37.1 4,619,476
37.13 4,619,477
153 4,619,478
190 4,619,479
217 4,619,480

CLASS 297

284 4,619,481
355 4,619,482
397 4,619,483

CLASS 298

18 4,619,484

CLASS 300

21 4,619,485

CLASS 307

2 4,620,108
10 LS 4,620,109
48 4,620,110
150 4,620,111
239 4,620,112
270 4,620,113
350 4,620,114
443 4,620,115
449 4,620,116
451 4,620,117
518 4,620,118
595 4,620,119

CLASS 310

166 4,620,120
323 4,620,121
328 4,620,122
331 4,620,123
332 4,620,124

CLASS 312

195 4,619,486

CLASS 313

25 4,620,125
325 4,620,126
440 4,620,127
630 4,620,128
4,620,129
634 4,620,130
636 4,620,131

CLASS 315

3 4,620,132
15 4,620,133
4,620,134
326 4,520,135
371 4,620,136
378 4,620,137

CLASS 318

254 4,620,138
4,620,139
332 4,620,140
483 4,620,141
578 4,620,142
811 4,620,143

CLASS 323

331 4,620,144

CLASS 324

54 4,620,145
58.5 A 4,620,146
77 A 4,620,147
99 D 4,620,148
103 P 4,620,149
103 R 4,620,150
127 4,620,151
225 4,620,152
309 4,620,153
4,620,154
322 4,620,155
424 4,620,156

CLASS 328

160 4,620,157

CLASS 329

50 4,620,158
4,620,159
104 4,620,160

CLASS 330

257 4,620,161

CLASS 331

45 4,620,162

CLASS 333

21 R 4,620,163
139 4,620,164
167 4,620,165
184 4,620,166
195 4,620,167
202 4,620,168
235 4,620,169
252 4,620,170

CLASS 335

20 4,620,171
78 4,620,172
205 4,620,173
212 4,620,174

CLASS 337

343 4,620,175

CLASS 338

128 4,620,176

CLASS 339

14 R 4,619,487
4,619,488
28 4,619,489
31 M 4,619,490
45 M 4,619,491
45 R 4,619,492
91 R 4,619,493
103 M 4,619,494
176 MP 4,619,495
177 R 4,619,496
244 R 4,619,497

CLASS 340

81 R 4,620,177
347 AD 4,620,179
347 DD 4,620,180
347 NT 4,620,178
566 4,620,181
568 4,620,182
4,620,183
675 4,620,184
682 4,620,185
703 4,620,186
825.05 4,620,187
825.87 4,620,188
856 4,620,189
985 4,620,190

CLASS 342

128 4,620,192
200 4,620,193

CLASS 343

6.8 R 4,620,191
747 4,620,194

CLASS 346

1.1 4,620,195
4,620,196
4,620,197
75 4,620,198
76 PH 4,620,199
108 4,620,200
140 R 4,620,201
4,620,202
153.1 4,620,203
204 4,620,204
4,620,205

CLASS 350

6.6 4,619,498
96.20 4,619,499
341 4,619,500
386 4,619,501
505 4,619,502
511 4,619,503

CLASS 351

163 4,619,504
211 4,619,505
243 4,619,506

CLASS 352

46 4,619,507

CLASS 353

122 4,619,508

CLASS 354

173.1 4,619,509
4,619,510
217 4,619,511
458 4,619,512

CLASS 355

3 CH 4,619,513
3 DD 4,619,516
4,619,517
3 R 4,619,514
4,619,515
4 4,619,518
11 4,619,519
14 D 4,619,522
14 R 4,619,520
4,619,521
15 4,619,523
53 4,619,524
64 4,619,525
73 4,619,526

CLASS 356

238 4,619,527
301 4,619,528
358 4,619,529
440 4,619,530

CLASS 357

4 4,620,206
22 4,620,207
23.1 4,620,208
30 4,620,209
4,620,210
38 4,620,211
51 4,620,212
55 4,620,213
63 4,620,214
81 4,620,215
4,620,216

CLASS 358

12 4,620,217
4,620,218
20 4,620,219
40 4,620,220
47 4,620,221
48 4,620,222
107 4,620,223
119 4,620,224
141 4,620,225
143 4,620,226
147 4,620,227
160 4,620,228
194.1 4,620,229
201 4,620,230
213 4,620,231
4,620,232
260 4,620,233
285 4,620,234
293 4,620,235
4,620,236
300 4,620,237

CLASS 360

8 4,620,238
4,620,239
48 4,620,240
73 4,620,241
74.1 4,620,242
77 4,620,243
4,620,244
85 4,620,245
96.5 4,620,246
97 4,620,247
4,620,248
99 4,620,249
102 4,620,250
103 4,620,251
106 4,620,252
107 4,620,253
132 4,620,254
4,620,255

137 4,620,256

CLASS 361

68 4,620,257
91 4,620,258
152 4,620,259
4,620,260
154 4,620,261
323 4,620,262
383 4,620,263
414 4,620,264
424 4,620,265

CLASS 362

32 4,620,266
71 4,620,267
74 4,620,268
80 4,620,269
123 4,620,270

CLASS 363

21 4,620,271
51 4,620,296
53 4,620,272

CLASS 364

136 4,620,273
200 4,620,274
4,620,275
4,620,276
4,620,277
4,620,278
4,620,279
426 4,620,280
475 4,620,281
489 4,620,282
493 4,620,283
498 4,620,284
513 4,620,285
4,620,286
518 4,620,287
4,620,288
521 4,620,289
578 4,620,290
607 4,620,291
748 4,620,292
845 4,620,293
900 4,620,294
4,620,295

CLASS 365

174 4,620,297
189 4,620,298
230 4,620,299

CLASS 366

3 4,619,531
110 4,619,532

CLASS 369

33 4,620,300
266 4,620,301

CLASS 371

1 4,620,302
16 4,620,303
20 4,620,304

CLASS 372

37 4,620,305
38 4,620,306
50 4,620,307

CLASS 373

105 4,620,308
128 4,620,309

CLASS 374

141 4,619,533

CLASS 375

17 4,620,310
19 4,620,311
22 4,620,312

CLASS 376

136 4,619,807
272 4,619,808
402 4,619,809

CLASS 378

19 4,620,313

CLASS 381

4 4,620,314
10 4,620,315
43 4,620,316
90 4,620,317

CLASS 382

2 4,620,318

CLASS 383

33 4,620,319
79 4,620,320

CLASS 384

94 4,619,534
472 4,619,535

CLASS 400

157.2 4,619,536
225 4,619,537
621 4,619,538

CLASS 401

85 4,619,539

CLASS 403

24 4,619,540
49 4,619,541
62 4,619,542
114 4,619,543
162 4,619,544
169 4,619,545
171 4,619,546
231 4,619,547
290 4,619,548
349 4,619,549

CLASS 404

80 4,619,550
90 4,619,551
117 4,619,552

CLASS 405

63 4,619,553
120 4,619,554
154 4,619,555
195 4,619,556
211 4,619,557
237 4,619,558
259 4,619,559
284 4,619,560

CLASS 406

89 4,619,561
182 4,619,562

CLASS 407

118 4,619,563

CLASS 408

146 4,619,564

CLASS 409

135 4,619,565
232 4,619,566
234 4,619,567

CLASS 411

222 4,619,568
347 4,619,569

CLASS 414

39 4,619,570
130 4,619,571
217 4,619,572
222 4,619,573
226 4,619,574
280 4,619,575
300 4,619,576
312 4,619,577
498 4,619,578
607 4,619,579

CLASS 415

12 4,619,580
143 4,619,581

CLASS 416

8 4,619,582
122 4,619,583
129 4,619,584
132 B 4,619,585
157 R 4,619,586

CLASS 417

319 4,619,587
366 4,619,588
388 4,619,589
407 4,619,590
422 4,619,591
429 4,619,592
498 4,619,593

CLASS 418

5 4,619,594
83 4,619,595
201 4,619,596

CLASS 420

463 4,619,810

CLASS 422

109 4,619,811
156 4,619,812
171 4,619,813

CLASS 423

27 4,619,814
74 4,619,815
139 4,619,816
220 4,619,608
266 4,619,817
306 4,619,818
317 4,619,819
328 4,619,820
579 4,619,821
592 4,619,822

CLASS 424

1.1 4,619,823
16 4,619,824
49 4,619,825
78 4,619,826
89 4,619,827
92 4,619,828
128 4,619,829

CLASS 425

7 4,619,597
131.1 4,619,598
186 4,619,599
197 4,619,600

CLASS 426

82 4,619,830
93 4,619,831
302 4,619,832
548 4,619,833
4,619,834

CLASS 427

8 4,619,835
41 4,619,836
44 4,619,837
53.1 4,619,838
82 4,619,839
91 4,619,840
96 4,619,841
163 4,619,842
213 4,619,843
248.1 4,619,844
422 4,619,845

CLASS 428

11 4,619,846
31 4,619,847
35 4,619,848
4,619,849
38 4,619,850
40 4,619,851
68 4,619,852
95 4,619,853
99 4,619,854
143 4,619,855
4,619,856
186 4,619,857
211 4,619,858
213 4,619,859
4,619,860
220 4,619,861
221 4,619,862
4,619,863
240 4,619,864
333 4,619,865
335 Re.32,270
336 4,619,866
355 4,619,867
425.1 4,619,868
480 4,619,869
596 4,619,870
607 4,619,871
632 4,619,872

CLASS 429

48 4,619,873
91 4,619,874
143 4,619,875

CLASS 430

11 4,619,876
31 4,619,877
56 4,619,878
58 4,619,879
4,619,880
77 4,619,881
95 4,619,882
203 4,619,883
223 4,619,884
260 4,619,885
265 4,619,886
313 4,619,887
353 4,619,888
406 4,619,889
495 4,619,890
505 4,619,891
4,619,892
519 4,619,893
942 4,619,894

CLASS 431

1 4,619,601
20 4,619,602
201 4,619,603
353 4,619,604

CLASS 432

14 4,619,605
99 4,619,606
162 4,619,607

CLASS 433

6 4,619,609
41 4,619,610
55 4,619,611
80 4,619,612
90 4,619,613
99 4,619,614

CLASS 434

22 4,619,615
4,619,616
265 4,619,617

CLASS 435

7 4,619,895
4,619,896
182 4,619,897
190 4,619,898
215 Re.32,271
287 4,619,899

CLASS 436

42 4,619,900
55 4,619,901
145 4,619,902
517 4,619,903
518 4,619,904

CLASS 440

88 4,619,618

CLASS 441

65 4,619,619
66 4,619,620
4,619,621
111 4,619,622
126 4,619,623

CLASS 445

22 4,619,624

CLASS 446

89 4,619,625
228 4,619,626

CLASS 455

619 4,620,321

CLASS 464

24 4,619,627
111 4,619,628

CLASS 474

28 4,619,629
72 4,619,630
80 4,619,631
4,619,632
82 4,619,633
201 4,619,634

CLASS 493

36 4,619,635
109 4,619,636
175 4,619,637
439 4,619,638

CLASS 501

97 4,619,905

CLASS 502

66 4,619,906
210 4,619,907
214 4,619,908
303 4,619,909
336 4,619,910
411 4,619,911
439 4,619,912

CLASS 514

2 4,619,913
15 4,619,914
17 4,619,915
18 4,619,916
77 4,619,917
93 4,619,918
166 4,619,919
167 4,619,920
180 4,619,921
4,619,922
185 4,619,923
195 4,619,924
200 4,619,925
210 4,619,926
218 4,619,927
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363 4,619,939
383 4,619,940
397 4,619,941
415 4,619,942
464 4,619,943
513 4,619,944
729 4,619,945

CLASS 518

700 4,619,946
716 4,619,947

CLASS 521

52 4,619,948

CLASS 522

170 4,619,949

CLASS 523

140 4,619,950
173 4,619,951
409 4,619,952
465 4,619,953
516 4,619,954

CLASS 524

29 4,619,955
87 4,619,956
91 4,619,957
102 4,619,958
114 Re.32,272
228 4,619,959
245 4,619,960
393 4,619,961
401 4,619,962
439 4,619,963
460 4,619,964
547 4,619,965
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801 4,619,967

CLASS 525

67 4,619,968
93 4,619,969
100 4,619,970
166 4,619,971
193 4,619,972
329.9 4,619,973
332.4 4,619,974
437 4,619,975
439 4,619,976
502 4,619,977

CLASS 526

84 4,619,978
88 4,619,979
96 4,619,980
125 4,619,981
164 4,619,982
247 4,619,983

CLASS 528

38 4,619,984
49 4,619,985
99 4,619,986
274 4,619,987
421 4,619,988

CLASS 530

417 4,619,989

CLASS 534

573 4,619,990
588 4,619,991
733 4,619,992
735 4,619,993
738 4,619,994

CLASS 536

20 4,619,995
55.3 4,619,996

CLASS 540

200 4,619,787
310 4,619,786
318 4,619,785
361 4,619,783
593 4,619,784

CLASS 544

124 4,619,997
193.1 4,619,998
196 4,619,999
235 4,620,000
310 4,620,001
318 4,620,002
354 4,620,003
357 4,620,004
391 4,620,005
402 4,620,006

CLASS 546

156 4,620,007
271 4,620,008

CLASS 548

155 4,620,009
217 4,620,010
262 4,620,011
411 4,620,012
412 4,620,013
545 4,620,014
547 4,620,015

CLASS 549

325 4,620,016
4,620,017
362 4,620,018
404 4,620,019

CLASS 556

18 4,620,020
19 4,620,021
417 4,620,022
460 4,620,023

CLASS 558

113 4,620,024
401 4,620,025

CLASS 560

85 4,620,026
104 4,620,027
122 4,619,782
193 4,620,028
204 4,620,029
338 4,620,030

CLASS 562

466 4,620,031
483 4,620,032
519 4,620,033
531 4,620,034
534 4,620,035

CLASS 564

256 4,620,036

CLASS 568

36 4,620,037
401 4,620,038
445 4,620,039
656 4,620,040
665 4,620,041
775 4,620,042
801 4,620,043
833 4,620,044
873 4,620,045
930 4,620,046
939 4,620,047

CLASS 585

10 4,620,048
438 4,620,055
452 4,620,056
481 4,620,054
500 4,620,057
501 4,620,049
640 4,620,050
663 4,620,051
4,620,052
664 4,620,053

CLASS 604

6 4,619,639
7 4,619,640
8 4,619,641
29 4,619,642
43 4,619,643
53 4,619,644
111 4,619,645
154 4,619,646
318 4,619,647
326 4,619,648
396 4,619,649
408 4,619,650
415 4,619,651
4,619,652
891 4,619,653
897 4,619,654

CLASS 623

1 4,619,655
6 4,619,656
4,619,657
4,619,662
22 4,619,658
23 4,619,659
46 4,619,660
55 4,619,661

CLASS 8.3

870 4,619,173

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D1—	102	286,340	D7—	17	286,360		447	286,380		53	286,400			286,420	D25—	1	286,431
D2—	25	286,341		45	286,361	D10—	8	286,381			286,401		163	286,421		19	286,432
	320	286,342		76	286,362		39	286,382			286,402		169	286,422		50	286,433
D3—	26	286,343		150	286,363		46	286,384		59	286,403		244	286,423		52	286,434
	40	286,344		317	286,364		106	286,383		63	286,404	D22—	22	286,425	D26—	65	286,444
D6—	349	286,345		321	286,365	D11—	19	286,385		78	286,405		110	286,424		86	286,445
	366	286,350			286,366		86	286,386		113	286,406	D23—	18	286,426		123	286,446
	390	286,351			286,367		90	286,387	D15—	127	286,407		122	286,427	D27—	24	286,447
	430	286,352		338	286,368			286,388	D16—	10	286,408			286,428		27	286,448
	474	286,353	D8—	72	286,369		114	286,389		32	286,409		141	286,429	D28—	2	286,449
	502	286,346		356	286,370		157	286,390			286,410			286,430			286,450
	507	286,347		373	286,371		164	286,391	D17—	99	286,411	D24—	8	286,435		49	286,451
	516	286,348		387	286,372	D12—	110	286,392	D19—	3	286,412		10	286,436			286,452
	534	286,349			286,373		147	286,393		59	286,413		21	286,437			286,453
	536	286,354	D9—	300	286,374		156	286,394		66	286,414		26	286,438		54	286,454
		286,355		337	286,375		189	286,395	D21—	72	286,415			286,439	D30—	15	286,455
		286,356		341	286,376	D13—	23	286,396		108	286,416		27	286,440	D32—	31	286,456
	587	286,357			286,377		24	286,397			286,417			286,441		49	286,457
	589	286,358		346	286,378		34	286,398		116	286,418			286,442		53.1	286,458
		286,359		370	286,379	D14—	30	286,399		148	286,419		45	286,443			286,459

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01 :	4,619,049		4,619,490		4,620,306	13 :	4,619,017		4,619,686		4,620,014
	4,619,684		4,619,495		4,620,310		4,619,021		4,619,826		4,620,125
	4,619,717		4,619,501	08 :	4,619,672		4,619,097		4,619,875		4,620,130
	4,619,819		4,619,502		4,619,749		4,619,373		4,619,930		4,620,192
04 :	4,619,100		4,619,507		4,619,872		4,619,554		4,619,935		4,620,240
	4,619,123		4,619,540		4,620,081		4,619,705		4,620,077		4,620,266
	4,619,142		4,619,550	09 :	4,619,101		4,619,842		4,620,109		4,620,272
	4,619,386		4,619,573		4,619,271		4,620,169		4,620,220		4,620,304
	4,619,465		4,619,640		4,619,299		4,620,270		4,620,320		4,620,305
	4,619,567		4,619,649		4,619,320	15 :	4,619,067	19 :	4,619,436	26 :	4,619,031
	4,619,568		4,619,651		4,619,364	16 :	4,619,011		4,619,620		4,619,103
	4,619,585		4,619,652		4,619,390		4,619,207	20 :	4,619,223		4,619,114
	4,619,722		4,619,714		4,619,391		4,619,341		4,619,422		4,619,139
	4,619,751		4,619,738		4,619,560		4,619,690		4,619,469		4,619,151
	4,620,274		4,619,764		4,619,613	17 :	4,619,051		4,619,586		4,619,208
	4,620,277		4,619,769		4,619,626		4,619,076		4,619,664		4,619,220
05 :	4,619,215		4,619,837		4,619,747		4,619,085	21 :	4,619,005		4,619,221
	4,619,401		4,619,839		4,619,783		4,619,115		4,619,126		4,619,232
06 :	4,619,003		4,619,840		4,619,808		4,619,169		4,619,380		4,619,242
	4,619,007		4,619,841		4,619,810		4,619,187		4,620,078		4,619,270
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	4,619,027		4,619,851		4,619,924		4,619,203		4,619,218		4,619,303
	4,619,046		4,619,895		4,619,978		4,619,256		4,619,298		4,619,366
	4,619,055		4,619,913		4,619,999		4,619,260		4,619,362		4,619,376
	4,619,059		4,619,914		4,620,009		4,619,261		4,619,475		4,619,478
	4,619,071		4,619,989		4,620,019		4,619,328		4,619,556		4,619,481
	4,619,081		4,620,000		4,620,122		4,619,426		4,619,668		4,619,564
	4,619,110		4,620,064		4,620,268		4,619,428		4,619,911		4,619,566
	4,619,158		4,620,075		4,620,286		4,619,702		4,620,026		4,619,590
	4,619,177		4,620,093	10 :	4,619,642		4,619,743	23 :	4,619,190		4,619,592
	4,619,199		4,620,107	12 :	4,619,032		4,619,821		4,619,948		4,619,610
	4,619,210		4,620,115		4,619,044		4,619,906	24 :	4,619,042		4,619,644
	4,619,219		4,620,120		4,619,069		4,619,955		4,619,075		4,619,719
	4,619,237		4,620,148		4,619,074		4,619,988		4,619,454		4,619,729
	4,619,245		4,620,149		4,619,087		4,620,047		4,619,653		4,619,827
	4,619,254		4,620,167		4,619,128		4,620,049		4,620,030		4,619,847
	4,619,259		4,620,170		4,619,249		4,620,066		4,620,095		4,619,865
	4,619,263		4,620,176		4,619,275		4,620,070		4,620,175		4,619,912
	4,619,268		4,620,181		4,619,358		4,620,105		4,620,224		4,619,933
	4,619,274		4,620,191		4,619,471		4,620,119	25 :	Re.32,271		4,619,937
	4,619,285		4,620,214		4,619,532		4,620,126		4,619,060		4,619,967
	4,619,290		4,620,215		4,619,618		4,620,208		4,619,145		4,619,968
	4,619,324		4,620,227		4,619,654		4,620,247		4,619,161		4,619,977
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	4,619,342		4,620,244		4,619,853		4,620,317		4,619,315		4,619,997
	4,619,345		4,620,254		4,619,939		4,620,319		4,619,370		4,620,045
	4,619,371		4,620,255		4,619,943	18 :	4,619,028		4,619,414		4,620,186
	4,619,378		4,620,262		4,620,028		4,619,040		4,619,645		4,620,223
	4,619,385		4,620,276		4,620,061		4,619,347		4,619,726		4,620,285
	4,619,398		4,620,288		4,620,160		4,619,365		4,619,784		4,620,294
	4,619,450		4,620,290		4,620,163		4,619,409		4,619,792	27 :	4,619,168
	4,619,467		4,620,293		4,620,179		4,619,555		4,619,894		4,619,216
	4,619,484		4,620,302		4,620,183		4,619,604		4,619,905		4,619,251

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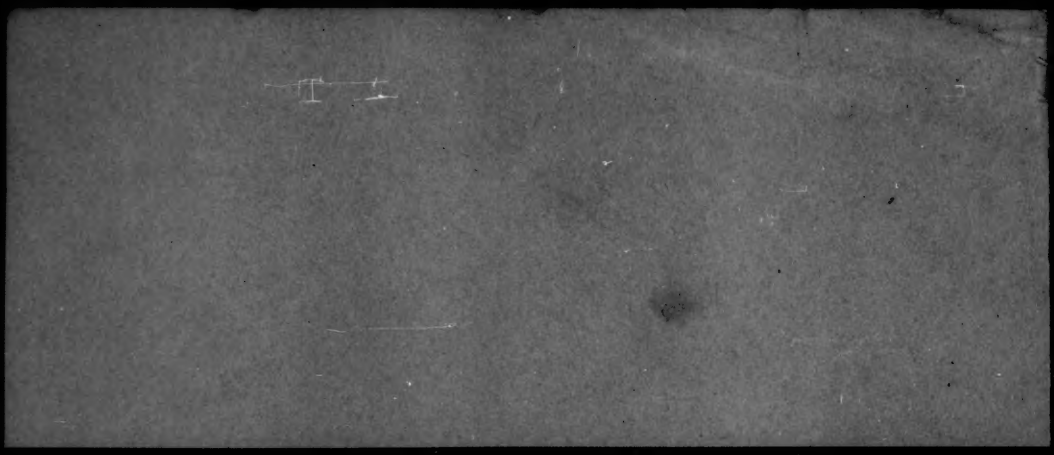

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